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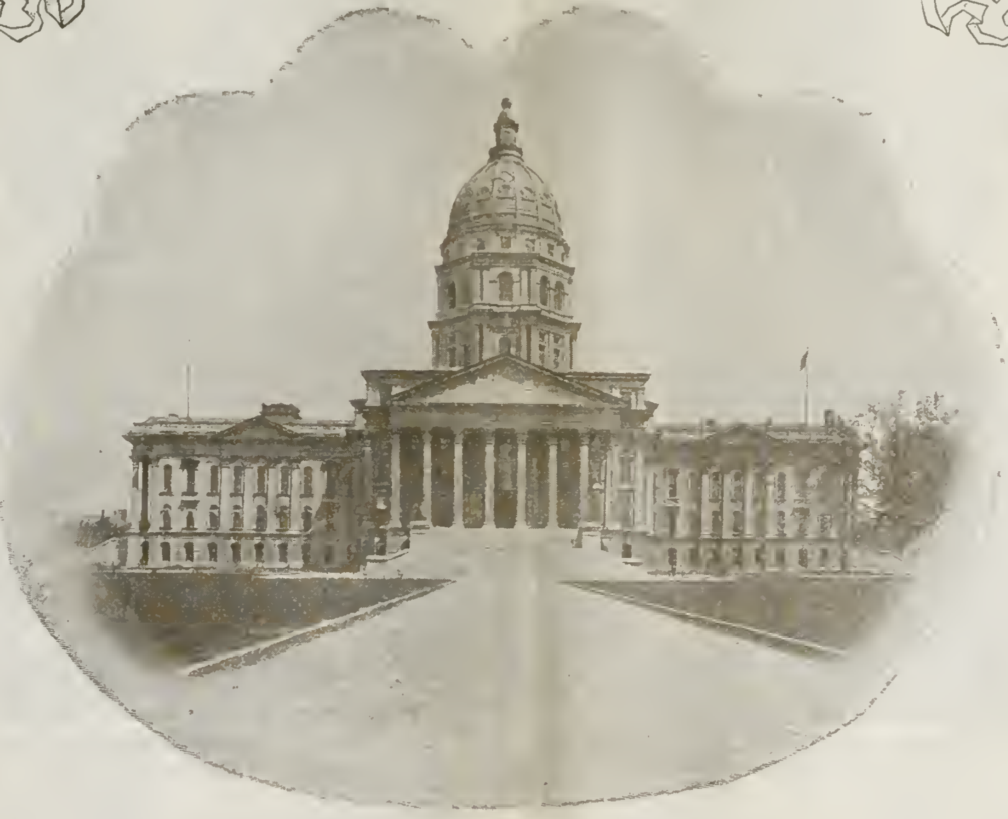

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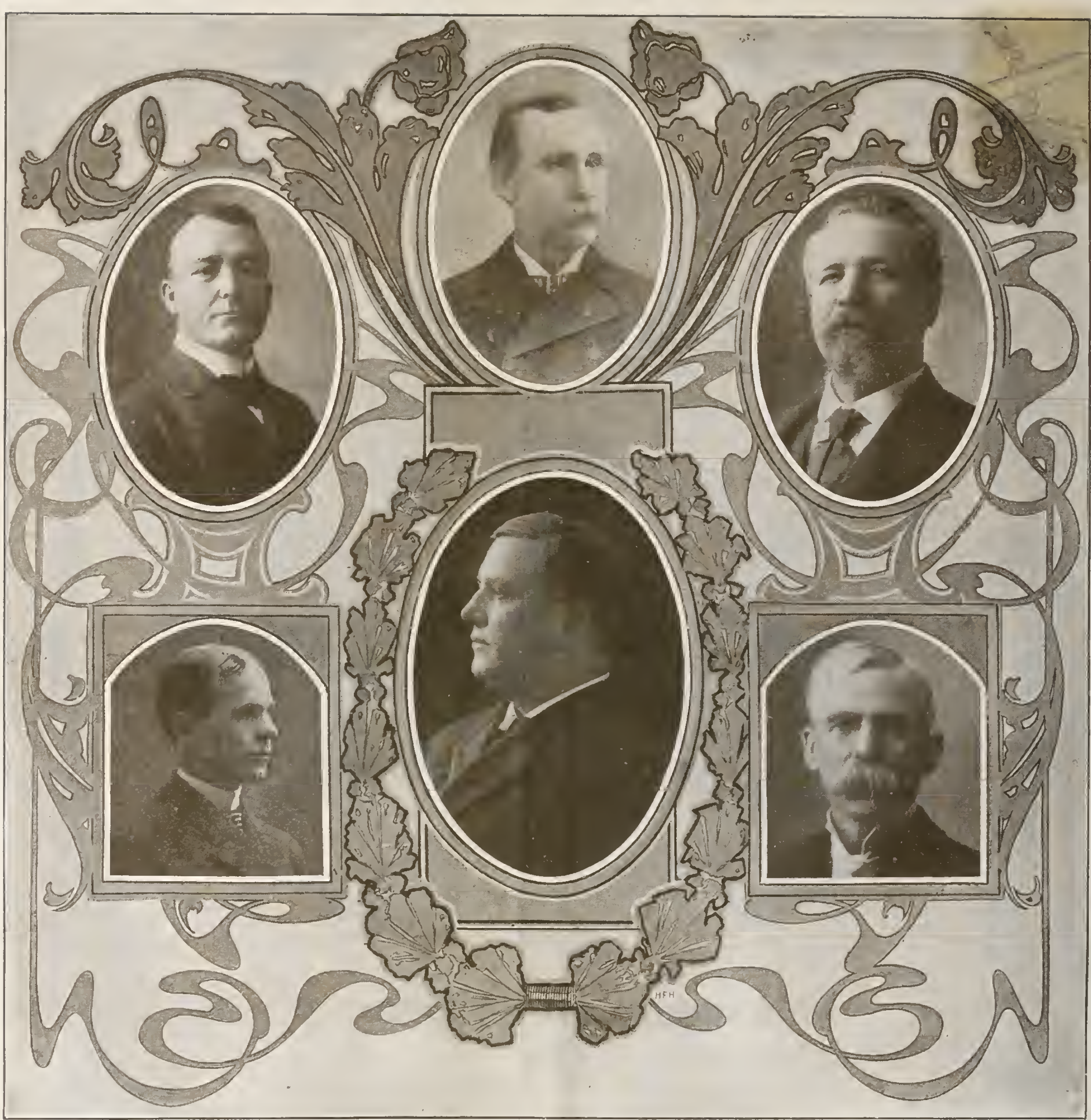

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HISTORICAL

By T. A. McNeal, Topeka.

THERE is a general impression that Kansas is young, and in a sense this impression is correct. When Kansas was admitted to the Union the older states had already enjoyed nearly three-quarters of a century of participation in the benefits and glories of the republic.

And yet Kansas historically is old, as age is measured in the annals of the new world, whose shores were first sighted in the gray of the October morning, by Columbus, four centuries ago.

Eighty years before the Pilgrim fathers anchored their ship on the storm-swept coast of New England, Kansas was making a record in history.

Two and one-half centuries before the untrained men in homespun repulsed the attack of the flower of England's army at Breed's Hill, the first real-estate boom was on in Kansas, and the stories of fortunes awaiting the settler attracted the attention of the Spanish chivalry, who were ready to endure any hardship to satisfy their hunger for adventure and gold.

At almost the same time that Coronado was making his weary and dangerous march from the south in search of the fabled Quivira, another famous knight errant, De Soto, was pushing westward through forest, swamp and fen in search of the riches which he supposed lay still beyond. It seemed to be a bitter irony of fate that this most gallant of all the sons of Spain should never have been permitted to progress further than Missouri, and, like Moses of old, die unsatisfied within sight of the promised land.

Back of the year 1541, recorded history, so far as Kansas is concerned, fades into tradition and scientific speculation.

No books printed on parchment or paper tell the story of Kansas in the earlier geological periods, but the mammoth bones of beast and fish and bird, preserved by nature's wondrous alchemy, tell the story of the important part that Kansas played when the world was young. It needs even now no straining of the imagination to picture the time, a million years ago, when Kansas, now supposed to be semi-arid by edict of nature and arid in spots by edict of law, was part of a wide and tranquil sea, whose eastern shore-line, possibly, was the Alleghany uplift, and whose gently sounding waves to the westward lapped the bases of the Rocky Mountains.

In the tepid waters of this vast inland sea swam monsters of bulk so huge that the leviathan mentioned in the Scriptures would have seemed by comparison like an insignificant minnow, while above the foam-crested billows, uplifted by mighty and unwearied wing, soared the horrid monsters of the air, many of them ten times the size of the condor of the Andes.

Then came the period of receding waters, the gradual drying up of the fountains of the great deep, and Kansas, covered with the slime deposited by the waters of ages, became dry land, fitted for the habitation of beasts and men.

Even in those prehistoric ages, separated from us by untold æons, there must have been some of the characteristics that mark the Kansas of the present. As the waters receded, and were gradually gathered into the oceans and gulfs and bays as we know them now, the mighty saurians that sported in the Kansas waters might have gone with the ebbing tides and found safe homes in the greater ocean, but with true Kansas spirit they stayed on, hoping that it would be wetter in the spring, until they finally left their bones as a rich harvest for fossil hunters of the ages that were yet to come.

Following the age of waters came the age of huge mammals, and vegetation to correspond with the character of animal life then existent. The lordly mastodon, with frame so huge that he shook the earth as he walked, then roamed over the plains of Kansas. In size often ten times greater than the largest Asiatic elephant, it follows of course that nature supplied him with provender in proportion to his bulk and appetite. Bluestem fifty feet in height swayed and bent in the breezes that fanned the teeming earth, and sunflowers a hundred feet tall opened their broad disks to meet the semitropic sun.

Colonel Henry Leavenworth, U. S. A., 1827.

What a period that would have been for the veracious real-estate agent and the newspaper man whose devotion to truth and exactitude of information know no variableness or shadow of turning! What crop stories he could have turned out; what marvelous tables of statistics showing the wonders of production!

Man is a modern creature. The period of his recorded history, as compared with the millions of years since the world first took form and place among the rolling spheres, is but a narrow span; but even now, and for ages past, there has been an unsettled dispute as to where man had his origin and first abiding-place. Biblical scholars have insisted that the garden in which he was placed, and which he was directed to keep, was located in Asia, but there is no place in that continent that fits the description given in holy writ. On the other hand, there is good reason to believe that in the bosom of the United States was the earliest human settlement, and that in the heart of Kansas the first ancestor of the human race looked out on his earthly paradise. . Four rivers there were that united to form the one river that flowed out of the Garden of Eden. The names have been changed, but there is every reason to believe that the four celebrated in sacred writ were the Republican, the Saline, the Solomon, and the Smoky, which united to form the Pison, now the Kaw. Here, in the beautiful valley where Junction City is now located, Adam and his fair young bride were placed to watch and guard and tend the garden, with its shady groves where squirrels built their nests, where the birds sang all day long, and where the air was fresh and fragrant with the breath of flowers. Here were all the conditions requisite to perfect happiness; but Adam, like many a Kansas man who has followed him, wasn't wise enough to let well enough alone. He and his wife didn't know a good thing when they saw it, and as a result lost their places and their jobs. Cast out among the pawpaws and hazel brush of Missouri, Adam spent the rest of his days filled with vain regret, and earning a scanty subsistence by hard and unremitting toil.

The final resting-place of Adam has been a matter of speculation, but a few years ago what are supposed to be his bones were found embedded near the town of Lansing, Kan Weary with the weight of his 960 years, the old man, with ineffable longing, had turned his face toward the home of his youth and perfect happiness, only to die just as he had again planted his feet on Kansas soil.

This account of the residence of the first parents of the human family will be disputed by envious inhabitants of less-favored commonwealths as fanciful, but I defy any one of them to bring proofs of its unreasonableness, or to show that any other locality on the face of the globe has a more absolute and authentic claim to the location.

Leaving the realm of speculation, and coming again to the era of recorded history, it may be said the first Kansas agricultural report is found in the narrative of his expedition, filed in the archives of Spain, by Francisco Vasquez de Coronado.

Coronado returned to Mexico, without doubt, a bitterly disappointed man. The seven cities, with their supposed advanced form of government and hoards of treasure, had proven a myth. His little command, after enduring untold hardships, which had cost many valuable lives, was broken and decimated until there was but a ragged, straggling band to follow its leader to the protecting shelter of the walls of Cortez's capital. But in spite of bitter disappointment and disaster, Coronado had really discovered a land destined to yield riches far in excess of all the stores of gold and silver dreamed of by the Spanish chivalry. In spite of his disappointment, Coronado was shrewd enough to have some conception of the value of the territory he had explored. Up in central Kansas he found, as he said, "a soil strong and black, and well watered by brooks and streams"; a soil, as he says, "the best possible for all kinds of productions of Spain."

It is hardly possible, however, that Coronado had any conception of the fact that some time the territory which he had explored would produce crops in a single year of more value than the yearly output of the gold- and silver-mines of both North and South America.

David R. Atchison, U. S. Senator from Missouri, 1843-1855.

After the disastrous expedition of Coronado, it was more than half a century before there was any further recorded effort on the part of the Spaniards to explore Kansas; but the Quivira story would not down; it stuck in the minds of the dons. It was a peculiarity of the Spaniards of that day that any kind of a story about a gold find went with them. If a modern, up-to-date promoter could have struck that crowd he would have found them easy marks. He could have sold them gold-shale stocks as long as one of them had a dollar left to put up.

In 1599 a Spaniard by the name of Don Juan Onata led an expedition in search of the Quivira which Coronado had failed to find. Nothing seems to have come of the Onata expedition; but three years later Penalosa, then governor of the territory of New Mexico, made still another expedition into Kansas, and was much impressed with its possible resources. From that time until Spain finally ceded her jurisdiction over the territory, in 1803, there were occasional expeditions by Spaniards into Kansas territory, but the Spaniard then, as now, was no good as a developer of a new country.

The Spaniards who followed Cortez and helped conquer Mexico were as good fighters as the world ever saw, but they were of little account when it came to building up a new country.

About the middle of the seventeenth century the French began to take an interest in the country west of the Mississippi.

As pioneers and builders of a new country the French were a trifle better than the Spaniards, but there is no occasion to do any boasting over their achievements. They were explorers who could and would endure any kind of hardship; but they would rather hunt and fish than farm.

It was about 1670 that good Father Marquette first heard of Kansas. He and some of his followers had sailed down the Mississippi until they passed the mouth of the Missouri. He learned that on this river were several "prodigious nations." The leading "prodigious nation," according to Marquette, was the Kansas tribe, the members of which tribe used wooden canoes. It was evident that even the red Kansans of that early day were fairly good advertisers.

John Brown, 1855-1859.

Another Frenchman of that day describes the Kansas tribe as enjoying complete liberty without jealousy. "The Kansan," says this writer, "enters the sachemic dome with the same simple freedom he enters the wigwam of a brother, neither dazzled at the splendor nor awed by the power of the possessor."

The spirit which animated the members of that tribe is still characteristic of the true Kansan, who has little veneration for titles or cringing subserviency toward those who may happen to occupy places of official place and power.

It was not until 1719 that the Frenchmen actually trod on Kansas soil. The first Frenchman to explore Kansas was Dutisne, who came up the Osage river and went west, probably as far as the middle of the state. Dutisne, in his report of his travels, makes special mention of finding rock salt of a fine quality. He probably did not anticipate that 200 years later Kansas would be one of the greatest salt-producing states in the Union; in fact, it is hardly to be supposed that he anticipated that this would be the central state of the greatest republic the world has ever known.

Andrew H. Reeder, Territorial Governor of Kansas, 1854–1855.

Between 1719 and 1803, when Napoleon sold the vast territory, including Kansas, to the United States, De Bourgmont and probably several other Frenchmen made trips through Kansas, but there was nothing done to change the existing conditions. The Indians were not disturbed; the soil was not stirred by the plow; the rich valleys brought forth no harvest other than the luxuriant vegetation of nature's planting. It was only when the government of the United States, under the leadership of Jefferson, became the owner of the vast area that had been shifted back and forth between the dominion of France and Spain, that systematic efforts began to be made to find out its real extent and possibilities for future development.

Jefferson himself had but a vague conception of the purchase he had made, but he was keen to know, and for that reason encouraged and urged the fitting out of an expedition to explore the country, if possible, to the Pacific shore. This expedition, led by those two intrepid captains, Lewis and Clark, was one of the most marvelous journeys ever undertaken or accomplished by man. It was different from the explorations conducted by Spanish and French adventurers, in that Lewis and Clark made careful note of what they saw, and were able on their return to give a comprehensive and intelligent description of the vast region they had traversed between St. Louis, the starting-point, and the Pacific ocean.

On the 14th of May, 1804, the Lewis and Clark expedition set out from St. Louis. For nearly seven weeks the explorers pursued their slow and toilsome journey across what is now the state of Missouri. On the morning of the 4th of July, 1804, at the mouth of a little stream which empties into the Missouri river, near where the city of Atchison now stands, the stars and stripes were flung out upon the breeze, a swivel gun boomed out its note of sovereignty and triumph, and the first Fourth of July celebration was held on Kansas soil. All day long the little band rested and celebrated, and, as the sun was sinking, the gun boomed again, and the soil of Kansas was dedicated to freedom and the republic.

Two years after Lewis and Clark had gone on to blaze a way across the plains and mountains, another gallant captain, leading twenty-two stalwart, fearless white men and some fifty Indian allies, started on another tramp across the plains. Among all the American soldiers who have dared to endure privations and dangers at the command of their country, many have commanded larger armies, and some have wrought greater things, but no one is better entitled than Capt. Zebulon M. Pike to a place in history or to the encomiums of his own and succeeding generations. With a determination that overcame every difficulty, and a spirit that quelled at no danger, he pushed on across the wind-swept prairies until he had reached the snow-capped Rockies, and scaled the peak which stands as an everlasting monument to perpetuate his name. In what is now the county of Republic he found a tribe that had not learned that there had been a transfer of authority. The Spanish flag was still floating above the camp. A less intrepid man than Pike would have passed by with his twenty-two men, but such an action was not in keeping with the bold and loyal nature of the young captain. Without a moment's hesitation he ordered the emblem of Spanish authority to be hauled down, and, elevating the stars and stripes in its stead, he proclaimed the sovereignty of the republic.

Following in the wake of Pike went Long and other intrepid explorers, giving to Jefferson and other leading statesmen of that period some idea of the magnificent extent and possibilities of the empire that had been acquired for what would now be considered a paltry sum, a financial burden which could now be easily assumed by the least wealthy of all the states of this Union. But in those days, be-

Charles Robinson, Governor of Kansas, 1861-1863.

fore steam had revolutionized commerce and made the people of all the world neighbors, civilization moved slowly. There was still a vast domain east of the Mississippi but sparsely settled — a wilderness yet waiting to be peopled and subdued. It was necessary that a generation should pass away before the fertile prairies should really begin to come under the dominion of the plow, and the teepee of the red man give place to the habitation of the Anglo-Saxon. As is usual, the missionary was the first permanent settler. Sustained by a fervid religious enthusiasm, he was willing to endure exile, privation and, if need be, martyrdom in order to spread the light as he saw it, and carry to the benighted savage the blessed precepts taught by the Peasant of Galilee. Carrying with him the Bible and the implements of agriculture, he taught the rudiments of productive and civilized industry to the red men at the same time that he was unfolding the plan of salvation and proclaiming the present advantages and future glories that awaited the true followers of the Prince of Peace. It is not strange, therefore, to learn that as early as 1820 a mission was established among the Osages by the missionaries sent out by the Presbyterian church, and that other denominations soon followed this example.

The first commerce of Kansas was, of course, along the line of its natural products, and, in 1822, the Missouri Fur Company, with Gen. William Ashley at the head, equipped a line of boats to ply up and down the Missouri river and trade with the Indians who hunted in the territory adjacent to its shores.

It was necessary for the government to be prepared to sustain its authority, if necessary by force of arms, and for that reason, as early as 1827, Col. Henry Leavenworth was sent out to establish a camp and later a fort on the banks of the Missouri river. He selected the present site of the city of Leavenworth, and that his judgment was good is proven by the fact that for more than three-quarters of a century the place he selected has been one of the most important military posts in the republic.

The new territory abounded with game, which fact probably induced the son of old Daniel Boone, with the hunter blood of his ancestor running strong in his veins, to seek the place of farmer for the Indians, which led up to the further fact that a grandson of the great Kentucky hunter and Indian fighter was the first white child to be born on Kansas soil.

As the years wore on the outposts of civilization were pushed westward. Missions were established here and there, around which gathered little settlements, the nuclei of commerce and population. Adventurous traders pushed out with their wagon-trains, until finally the great trail was laid out between the Missouri river and the mud-built capital of New Mexico, founded nearly three centuries before by the followers of Cortez. This trail, with its long, slow-moving trains, became the great artery of commerce of the plains and the forerunner of the greatest railroad system of the United States.

James H. Lane, U. S. Senator from Kansas, 1861-1866.

Samuel C. Pomeroy, U. S. Senator from Kansas, 1861-1873.

It seems strange now, when states are made in a day almost, when it has grown so common as hardly to excite remark to see busy cities at sundown where in the morning there was virgin prairie, where the coyote barked and the prairie-dog chattered, to think that almost half a century should have been allowed to pass after Jefferson made his bargain with Napoleon Bonaparte before the real permanent development of this territory lying west of the Missouri should have begun, and the central state of the Union should have actually commenced to take shape and form.

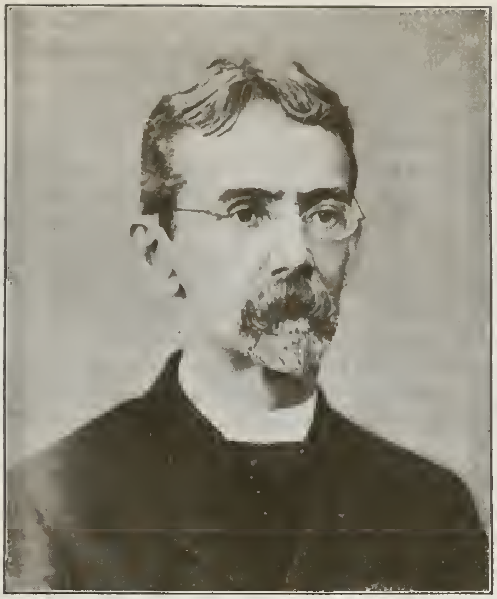
For more than sixty years the antagonistic forces of slavery and freedom had been preparing for the final grapple, which the more far-seeing knew to be inevitable, but which, dreading the terrible cost and consequences, they had endeavored to put off as long as possible. By a series of compromises, by bringing into the Union states in pairs, one dedicated to freedom and one to human slavery, they had managed to maintain the balance, but if the line which had been determined on as the division between slave and free was to be continued westward to the Pacific, the advocates of slavery saw that defeat was inevitable, and that the extinction of slavery was but a question of time. The new territory which stretched away from the Missouri line to the snow-capped crest of the Rocky Mountain range seemed favorable soil for the planting of the tree of human slavery, and, with an arrogant contempt for compacts previously made, the Southern leaders determined to hold it for their own. As the years had gone by since the Missouri compromise, the slave-holding aristocrats had grown insolent in their demands, encouraged by the cringing subserviency of the North, whose leaders feared to oppose the haughty sons of the South on account of the possible effect on their political and business interests. At the bidding of the slave power, the Northern "mudsills and traders" had not only passed laws to protect the rights of property in human beings in the South, but they had even consented to become "nigger catchers," and to render themselves liable to both fine and imprisonment if they even so much as tendered a cup of cold water to the footsore and weary black man fleeing toward the north star and liberty.

It was not particularly surprising that the South should have expected little trouble in taking possession of the new territory. According to compromises and compacts formerly made it belonged to the North and to freedom, but the North always had given up to the South, and what reason was there to expect that there would be any determined opposition now?

In this case, the South did not reckon with the powerful sentiment that had been gathering head for years among the middle classes of the North—not the politicians who were always ready to trim and compromise for the sake of policy, but the common people, who loved liberty and hated slavery, oppression, and wrong. It was this class, the worthy descendants of the Pilgrims, who determined that Kansas should not be given up to slavery without a struggle. The movement which started in New England was reenforced by the sturdy, liberty-loving citizens of the Middle West; peace-loving men but who were ready to fight if that was necessary, and, who, when the clash came, showed a stubborn courage that would have done credit to the followers of Cromwell, who chanted psalms as battle-hymns and followed their leader against whatever odds with absolute confidence of victory.

The national administration was in absolute sympathy with the slavery propagandists, but made the mistake, from a Southern standpoint, of appointing an honest man as territorial governor. Andrew H. Reeder, the first governor of the territory, was a conservative Democrat who had no sympathy with the abolition movement, and in the slavery discussions had sided with the South; but when as governor of the territory he saw armed ruffians, non-residents of the territory, take possession of the polling-places, and, while refusing to allow *bona fide* citizens the privilege of casting their ballots, stuff the boxes with illegal votes, he refused to countenance the outrage or give official recognition to the travesty. He was dismissed from office and forced to leave the territory disguised, while a man supposed to be more in sympathy with the Southern idea was placed in his stead.

The free-state forces were undaunted; the struggle went on, with slavery fighting a losing battle, and full two years before Kansas was admitted into the Union as one of the states the slavery advocates had practically given up the struggle. John Brown, convinced that his services were no longer needed in Kansas, organized and started to put into



John J. Ingalls, U. S. Senator from Kansas, 1873-1891.

execution his mad scheme which ended with the capture or death of his fanatical followers and his own execution on the scaffold.

Kansas was admitted to the Union as the administration of James Buchanan was drawing to its inglorious close. Among the few acts which reflected some little credit on the four years' rule of that weak and vacillating man was the fixing of his official signature, on the 29th day of January, 1861, to the bill admitting to the Union the State of Kansas, already scarred with the marks of conflict, fresh from a bloody baptism, but consecrated to loyalty and freedom forevermore.

The first legislature of the new state convened on the 26th of March, 1861, and the message of the governor was delivered on March 30. Thirteen days after the delivery of the first governor's message to the legislature rebel cannon were battering at the walls of Fort Sumter, and before the new state had had time to fit to itself the garments of peace it was compelled to discard them for the panoply of war. The Kansans took to fighting as if war had been their trade. There was hardly an able-bodied man within the Kansas borders who did not, at some time during the conflict, buckle on a sword, help man a battery, or carry a musket, and the rolls of her regiments exceeded in number the entire list of eligible voters.

With the return of peace came back the bronzed Kansas veterans, and with them came 100,000 other men who had worn the blue, as determined and courageous in their efforts to subdue the prairie and build for themselves homes as they had been in doing battle for the preservation of the Union and the perpetuation to succeeding generations of its power and glory.

Born, as it were, amid the stress and storm of conflict; springing, like Athena, from the brain of Jove, full armed and prepared for battle, the subsequent history of the state strongly shows the effect of prenatal influences in the strenuous character and radical trend of her people. Intensely patriotic, hopeful, even flamboyant, they admire the spectacular, and tend to radicalism as the sparks to fly upward. They have never shown excessive modesty in refusing to proclaim their own virtues, or their manifest, abundant and varied resources, and during occasional periods of disaster they have even seemed to derive some satisfaction in advertising their own calamities. To be at the head of the procession, no matter which way it might be going, has been their manifest desire, and Kansas has gotten more advertising at the top of the column and next pure reading-matter, in proportion to her age, than any other state in the Union. Other states raise great crops, but when Kansas comes in with whatever crop may happen to be her specialty that particular year, the others go into eclipse and Kansas becomes the center of universal attention. If Providence frowns and the clouds of adversity lower, if the land is scourged with locusts, Kansas points with melancholy pride to the fact that none of 'em can show up as many 'hoppers to the square foot as this blessed state; and in the moments of direst disaster she calls attention to the superior quality of her sackcloth and ashes.

Preston B. Plumb, U. S. Senator from Kansas, 1877-1891.

The development of Kansas industries and the growth of her institutions are part of her history, but of them other gentlemen have been delegated to speak. The story of Kansas is unique, and her development along many lines without a parallel. During her short life as a state she has built a capitol surpassed by few state capitols either in commodiousness or elegance of finish. She has built and equipped charitable institutions that take rank with similar institutions in the oldest and wealthiest states in the Union. She has built and equipped state institutions of learning that call forth the warmest compliments from experienced educators of this and other countries; and all these have been paid for as they were built, without leaving any burden of debt to succeeding generations. She has a rapidly growing fund for the support of public schools which has already reached the enormous total of nearly ten millions of dollars. Perhaps no state of the same population has fewer millionaires, and not one of equal population can show so few paupers. With generous humanity the various counties in the state have provided homes for the indigent, but in many cases they are only occupied by the custodians employed to care for them. By way of example may be cited the case of a county which, at an expense of some $10,000, provided a home for the indigent and helpless. In this elegant and spacious dwelling, for years, was a single pauper, who passed his declining years in comfort and undisturbed leisure.

That Kansas is only at the beginning of her development there can be no doubt. Every day discloses new resources that have lain hidden below the surface, and each succeeding season discloses new possibilities in the productiveness of her soil. Her 82,000 square miles of territory are capable of sustaining in comfort a population of ten millions of people. Within twenty-five years the aggregate value of property within the borders of the state will be quadruple what it is now, and the person who invests now and holds on will find that he made the most fortunate venture of his life.

In no state is there a higher general average of intelligence, and in no state is there less excuse for being ignorant.

Proud of the history of the state and confident of her future, the Kansan does not ask the prospective citizen to take any one's word for what Kansas has been, is, or expects to be. Let the stranger come and see.

Central and Western Kansas as it appeared in 1864, forty years ago.

AGRICULTURE

By F. D. COBURN,

Secretary, Kansas Board of Agriculture.

KANSAS, an agricultural empire, felicitously termed by John James Ingalls "the navel of the nation," is the heart of the territory the purchase of which is commemorated by the Universal Exposition in St. Louis, U. S. A., in this year of our Lord 1904. The area of the Louisiana province, bought of Napoleon in 1803 for $15,000,000, is 875,000 square miles. Over 82,000 square miles of this now constitute the state of Kansas, and in a single year, 1901, on about one-tenth of her entire area, according to the United States Department of Agriculture, there was produced wheat of a value sufficient to cover nearly four times the original cost of the whole Louisiana territory, or a sum amounting to $58,500,000. This is the value of but one commodity, and it of secondary importance among the standard crops of the state, as the value of the corn yielded is generally the chief asset in her agricultural productions.

The area that comprises Kansas cost, approximately, $1,800,000, and in 1903 alone there were produced on her fertile prairies farm products and live stock worth over $387,500,000, or more than $260 for each inhabitant.

Since the signing of the treaty transferring the wilderness of the Louisiana province to the United States, 100 years ago, this territory has been in less than half that time transformed as if by magic into the most profitably productive agricultural domain in the world, and of this Kansas is the garden spot. In the Louisiana Purchase are the states which lead in agricultural pursuits and have become famous for the excellence of their immense productions. The development of their resources is unparalleled in the world's annals, and among these Kansas stands preeminent in performance; yet her past achievements are but a hint of future possibilities, as her present record represents only the product of a state the development of which has scarcely more than begun.

The statements herein will doubtless come to the attention of thousands who know little or perhaps nothing of, or have at best but vague ideas of Kansas or what the word signifies—whether the name of a country, district, colony, or province; whether morass or mountain; whether forest or prairie; a land of productivity or of barren waste.

To those who would, but do not know, it may be said that the name implies a section of country 210 miles wide and 400 miles long; of 52,000,000 acres; the core of a continent—midway between the Atlantic and Pacific oceans, and also equidistant from the northern and southern boundaries of the United States of America, between the thirty-seventh and fortieth parallels.

By some, her area may be better understood from the statement that Kansas, practically all arable, fertile land, is some four per cent. wider in extent than England, eighty per cent. larger than Scotland, seventy per cent. larger than Ireland, and seven times greater than Wales. Others may grasp more readily the thought that either Denmark or Switzerland is little more than a fourth as large, and the Netherlands are not one-fourth; that Belgium has not one-fourth her area, and Cuba but four-fifths; while the states of New York and Indiana, or Maine and Ohio, united, or all New England, with Delaware and Maryland for company, could find resting room on her ample bosom.

The surface of the state is that of a gently undulating plain, having a gradually increasing altitude from 750 feet at the eastern limit to 3300 feet at the western or Colorado border. No mountains and no swamps find place in her topography. In soil there is much diversity; from the dark, deep loam of limestone land, prevalent in the eastern third, to the "plains" and sandy formation to the westward, the latter being more especially common to the southwest. Their comparative fertility is an unsettled problem, as the possessor of either is satisfied that no other is quite so fertile as his own.

Her climate is such as would be expected in such a zone and along such parallels, having neither tropic heat nor arctic cold. The official in charge of the United States weather service for Kansas funishes the following as from his records covering the last seventeen years:

Average temperature during the three winter months—December, January, and February, 30.9.

Average temperature during the three summer months—June, July, and August, 76.9.

Average annual temperature for the state, 54.2.

The average annual rainfall in the eastern third of the state for seventeen years approximates 35 inches, gradually decreasing further west. For the whole state, the annual precipitation has averaged 27.12 inches.

For the three winter months—December, January, and February, 0.91 inch per month.

For the three summer months—June, July, and August, 3.55 inches per month.

There were no white inhabitants in Kansas in 1850; in 1856 there were less than 10,000, and in 1860 but 107,000. In March, 1903, her population was 1,487,847.

The state is divided into 105 counties; the largest of these in area is Butler, with 1428 square miles, and ranking nineteenth in population, with 22,269 inhabitants; the smallest county is Wyandotte, with 153 square miles, but first in population, with 81,251 inhabitants, and including Kansas City, the seat of the second largest live-stock market, and also of the second most extensive meat-packing industries, in the world. In this market there were received and disposed of in the past year 2,137,112 cattle, 1,969,381 hogs, 1,151,730 sheep, and 67,274 horses and mules. Of these, there were slaughtered at the local packing establishments 1,234,449 cattle, 1,891,708 hogs, and 797,313 sheep.

In 1902 the state had, besides 218 colleges, academies, and high schools, 9160 free public-school houses, where 389,272 pupils were enrolled and 11,709 teachers employed, at an annual outlay of $3,311,004 for salaries. The schoolhouses and school property are valued at $11,660,470. The State University, at Lawrence, takes high rank among like institutions in the older states, and the same is true of the State Normal School, at Emporia; while the State Agricultural College, at Manhattan, is claimed to stand at the head of the list of the agricultural colleges in the United States, and, therefore, of the world, having enrolled over 1300 students the present year—1904. The institution for the education of deaf-mutes, at Olathe, reflects credit upon the state, while the same compliment is due to the school for the education of the blind, located at Kansas City.

The number of church organizations aggregates about 6000, having a membership of 325,000, and property to the amount of $8,000,000.

In the line of newspaper and periodical literature, there are now being issued and maintained within the state more than 754 publications, representing every county, and recording the history of the people of all communities and neighborhoods. Of these, 61 are dailies, 604 weeklies, 1 triweekly, 3 semiweeklies, 63 monthlies, 10 semimonthlies, 2 bimonthlies, 7 quarterlies, and 4 occasionals.

Of state, private and national banks there are 664, having deposits aggregating ninety-five million dollars, making an average of sixty-five dollars for each inhabitant.

In the main, Kansas laws are liberal and just. They favor sobriety, morality, industry, wholesome living, and home-making. While they in no wise oppose the rich, they do uphold, protect and encourage the poor man in his effort to secure a home for himself and family. The manufacture and sale of intoxicating liquors, except for medical, scientific and mechanical purposes, is forever prohibited in the state, by constitutional provision adopted by the people at a general election in November, 1880.

Of railroads Kansas has a trifle more than 10,250 miles. This mileage is exceeded possibly in two or perhaps three other states. It is about the same as Italy, not quite half that of Great Britain and Ireland combined, slightly less than that of Spain and Switzerland together, and one-third that of all Germany. Of the 105 counties, 100 have one or more railroads, and, excepting seven, all county-seats have one or more. There is an average of a mile of railway for each 145 of the inhabitants. The main lines are maintained in excellent condition, and the service is as good as may be found anywhere. Much of the main-line track has been well ballasted with gravel, stone, cinders, slag, or other superior material. Their earlier and lighter rails are constantly being replaced by those of heavier steel, joined by the best modern devices, so that the average speed found in any part of the country is here obtained with almost perfect safety, injuries from train derailments or other like accidents being comparatively infrequent. The rolling-stock compares favorably with that in use in any country; and generally, so far as railroads are concerned, Kansas challenges comparison with any. The maximum charge to passengers on first-class trains is three cents per mile.

From Kansas City, Kan., where the Kansas river joins the Missouri, at the east line of the state, the distances by rail to the various ports, East, South, and West, are about as follows:

	MILES.		MILES
To New York	1,394	To Galveston	709
To Savannah	1,081	To Chicago	458
To New Orleans	878	To San Francisco	2,100
To Port Arthur	820	To Seattle	2,234

When the Wheat is in the Shock—"Out There in Kansas."

Of unappropriated and unreserved public land in Kansas, belonging to the United States government, there are yet 1,000,000 acres which are available to actual occupants by homesteading for a very small outlay of money, extended over a period of years. Much of the larger portion of this land is in the western counties, and more adapted for grazing purposes than for grain-farming and home-making.

The state is watered and drained by several important non-navigable streams, viz.: The Kansas, Arkansas, Republican, Solomon, Blue, Smoky Hill, Marais des Cygnes, Saline, Neosho, Medicine, and Cimarron, besides innumerable smaller rivers and creeks, which one with another course through many hundred miles of rich valleys, in the east more or less timbered. Geologists who have investigated the subject agree that a large portion of Kansas has beneath the surface inexhaustible supplies of pure cold water at a depth of 10 to 200 feet, available for irrigation purposes. Every investigation affords further evidence of the quantity being unlimited, and its inexpensive pumping and storage in reservoirs for any use are made readily practicable by the modern windmill. Artesian waterflow in abundance has been developed and is utilized in a portion of Meade county, but not elsewhere as yet, worth mentioning.

Wonderful deposits of zinc, lead, coal, natural gas and petroleum are constantly being uncovered in the southeastern counties; quarries of superior limestone, sandstone and gypsum for building purposes are worked in the more central counties. Extending from north to south, and underlying many of these, and being successfully and largely drawn upon, is a salt bed, stated by geologists to be not less than 200 miles from north to south, 60 miles wide, and 400 feet in thickness.

Fruit, especially apples, peaches, grapes, and berries, of high quality, is largely grown in Kansas, and some of the largest commercial orchards in existence are found here, the products of which are sought eagerly by distant packers and exporters for the domestic and foreign markets.

Next to her high order of citizenship, it is, however, upon agriculture proper and live-stock husbandry that Kansas bases her claims to preeminence and future wealth. What virtue there may be in such claims, what the possibilities of the present are, and what the probabilities of future promise, are well suggested by the official record, setting forth her agricultural yieldings in the year 1903, presented in the table on following page.

The valuations given are those at home and on the farms, instead of in the market centers.

"The child is now born on Kansas *soil that will live to see this state the fifth in agricultural production in the Union."* Horace Greeley, at Osawatomie, May 18, 1859. [Mr. Greeley's prophecy is more than fulfilled; Kansas has already attained FIRST place in agricultural production.]

KANSAS' AGRICULTURAL YIELDINGS.

1903.

Productions.	*Quantities.*	*Values.*
Winter and Spring Wheat	94,041,902 bus.	$52,426,355 55
Corn	169,359,769 "	57,078,141 67
Oats	28,025,729 "	8,042,764 06
Rye	2,962,392 "	1,255,257 96
Barley	4,854,337 "	1,589,907 87
Buckwheat	1,974 "	1,579 20
Irish and Sweet Potatoes	5,385,837 "	4,099,960 18
Castor-beans	1,758 "	1,758 00
Cotton	75,040 lbs.	6,753 60
Flax	606,214 bus	484,971 20
Hemp	200 lbs.	10 00
Tobacco	13,650 "	1,365 00
Broom-corn	8,682,335 "	322,841 25
Millet and Hungarian	519,163 tons.	1,855,059 00
Sorghum for Syrup	1,341,624 gals.	509,817 12
Sorghum, Kafir-corn, Milo Maize, and Jerusalem Corn, for Forage	....	9,868,683 00
Tame Hay	1,267,340 tons.	6,970,370 00
Prairie Hay	1,811,706 "	7,246,824 00
Wool Clip	632,997 lbs.	94,949 55
Cheese, Butter, and Milk	....	8,627,018 70
Poultry and Eggs sold	....	6,498,856 00
Animals Slaughtered or sold for slaughter	....	54,644,272 00
Horticultural and Garden Products and Wine	....	2,088,553 00
Honey and Beeswax	770,986 lbs.	108,555 91
Wood Marketed	....	159,885 00
Total Value	....	$223,984,508 82

NUMBERS AND VALUES OF LIVE STOCK.

Horses	845,404	$63,405,300 00
Mules and Asses	101,089	8,895,832 00
Milch Cows	802,738	21,673,926 00
Other Cattle	2,745,586	54,911,720 00
Sheep	167,044	501,132 00
Swine	1,770,585	14,164,680 00
Total Value	....	$163,551,490 00

Grand total for 1903..........$387,537,098.82.

The net increase in value of the 1903 agricultural productions over those of 1902 is $7,982,453, and of live stock, $8,444,078, or a total net increase for the year of $16,426,531, or 4.4 per cent. In two years the increase in the value of agricultural productions has been $28,729,856, and of live stock, $10,851,774, or a total net increase in 1902-'03 of $39,581,630.

"If I had been commanded to choose one spot on the globe upon which to illustrate human development under the influence of liberty, I could have chosen no part of God's footstool so interesting as Kansas*—yesterday an infant, to-day a giant, to-morrow—who can tell?"* John W. Forney (the veteran Philadelphia editor), at Lawrence, September 15, 1879.

WHEAT

WITH the records of the State Board of Agriculture for authority, the 1903 yield of wheat was the greatest produced by Kansas, and in the past four years Kansas has raised three crops, each of which has the distinction of being bulkier than the production of any other state. Further, it is interesting to note that in the past thirteen years Kansas has raised eight crops averaging over 70,000,000 bushels each, and aggregating 561,270,148 bushels, or an amount more than the average year's output for the whole United States. In 1901 Kansas raised nearly one-seventh of the entire quantity of wheat produced in this country that year, and of an average crop for the United States its proportion was considerably more than one sixth.

To lead in any worthy enterprise or undertaking is certainly a distinction of which it is pardonable to be proud; to so far excel as to early and easily surpass all competitors, old and young alike, is an honor vouchsafed to few, although persistently sought by many. This, in truth, however, aptly describes the status of Kansas as a wheat state; having successfully distanced all others, and now, almost without a close competitor, she is forced to be content with exceeding only her own previous feats.

In her brief career, Kansas has made a record in some directions unparalleled by any other state of agricultural environment and ambition. Not alone in wheat production has she achieved preeminence, but as a commonwealth where a diversified agriculture flourishes she is premier, annually producing all field crops in generous profusion, and rearing and marketing animals of well-nigh incalculable value, in which lies the state's greatest wealth.

Wheat is one of her most conspicuous items of production, although not foremost. Without doubt the three greatest crops of winter wheat, of highest quality, often testing far above the standard requirements, ever grown to maturity in any state in the world, have been harvested within the borders of Kansas, in 1903, 1901, and 1900; and in the latter year, when her total yield was the lowest of the three, she raised more wheat by about 2,500,000 bushels than the combined output of the two ranking next highest that year in the United States, viz., Minnesota and California. After the prairies were broken, and since once fairly started, the state has ranked among the very foremost, so early as 1892 leading all others by producing nearly 74,000,000 bushels, which up to that time was the largest yield ever credited to any state. The year before she was second in rank. While among the highest, since then her position has fluctuated somewhat until 1900, when, as a reward by kindly Providence of industry and thrift, she again easily ascended to first place, which rank was more fully than ever before maintained in later years.

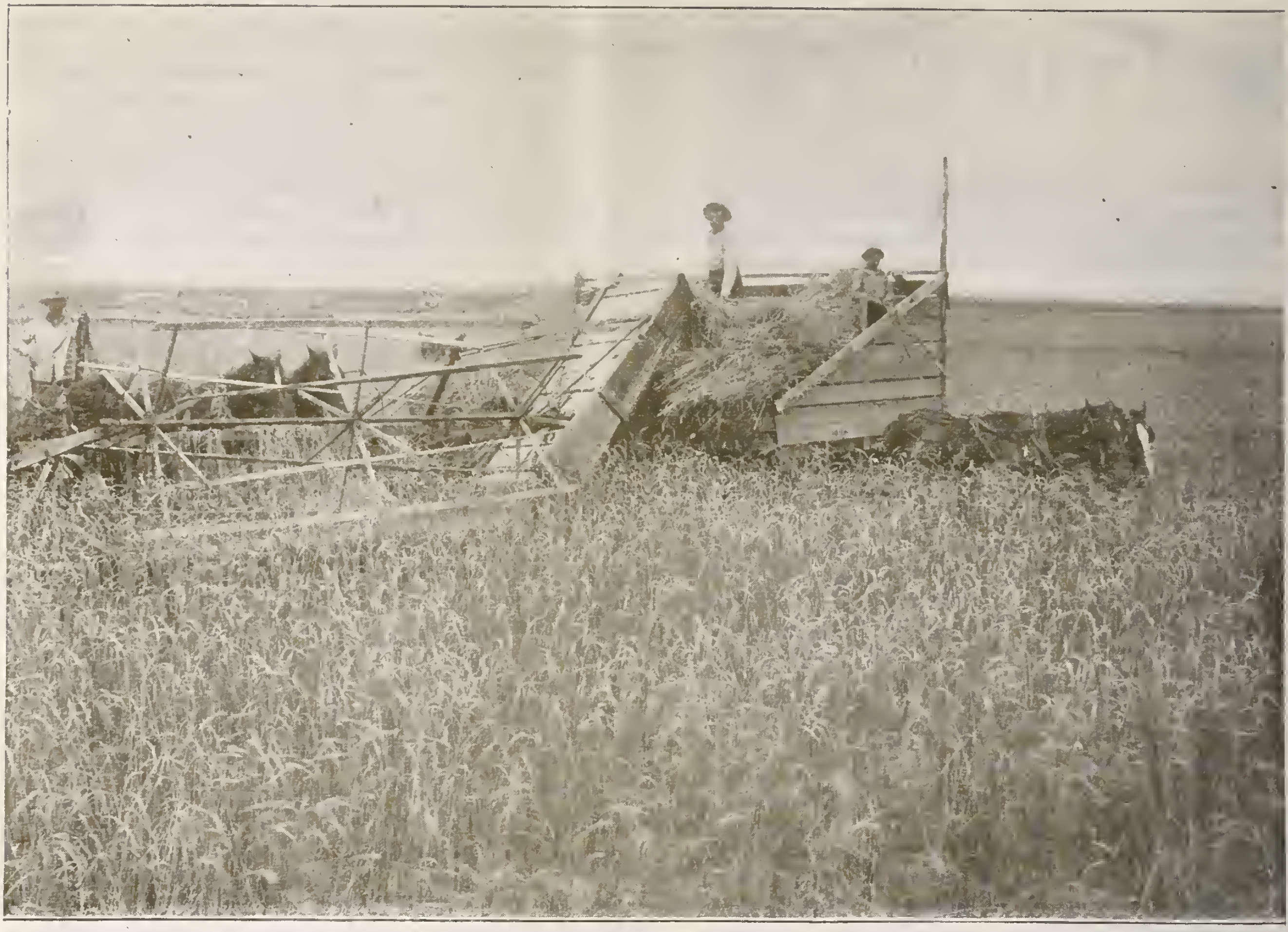
The state's 1903 production is seventy-three per cent. greater than the average yearly output in the past decade. The 1901 yield was more by 11,915,183 bushels, or 15.2 per cent., than the United States Department of Agriculture has ever reported raised by any state in any year, barring the Kansas yield in 1900, which, according to the same authority, had for the preceding year the distinction of being the bulkiest, but only until Kansas had another season, when she of all the states surpassed her own record and produced a still greater crop. Nearly thirteen per cent. of the 1903 yield was in Sumner, Barton and Rush counties—Sumner, with 3,803,760 bushels to her credit; Barton, with 4,869,054; and Rush, with 3,491,136. These three counties, in 1903, produced more wheat than was grown the year before, according to the government's figures, in all New England and the states of New Jersey, Delaware, Alabama, Arkansas, Montana and South Carolina combined. The four counties of Sumner, Barton, Rush, and Stafford, in 1903, produced more wheat than either the entire state of Iowa or the territory of Oklahoma in the year previous.

In 1901 one county (Sumner) was credited with a yield of 6,819,266 bushels of wheat, which is greater than the total output for the same year of all the New England states and seven additional states and territories thrown in for good measure. In the same year twenty of the states listed by the United States Department of Agriculture as wheat-growers each had a yield less in quantity than the 1901 production of Sumner county; the total of its 1900 and 1901 crops amounts to 12,580,526 bushels, worth $6,976,459.

It is difficult for any one who has not been in touch with, or directly observant from year to year of, the progress and expansion of our wheat-growing, from its small beginnings forty years ago, to comprehend how it is that the state has gradually come to occupy the foremost rank, and how in a quarter of a century what were known as "soft" wheats have in nine-tenths of the fields been displaced by the red, flinty sorts, introduced from Russia, yet in every-day parlance grouped under the general head of "Turkey" wheat.

Forty years ago the Kansas area sown to wheat of all kinds, winter and spring, hard, medium, and soft, white and otherwise, was less than 10,000 acres. For ten years, ending with 1903, the average of winter wheat alone has been 4,623,000 acres, and the yield per year, counting the good with the bad, was 53,764,992 bushels, the 1903 area being 5,911,906 acres. The largest area previously sown to winter wheat was 6,254,747 acres, from which the crop of 1902 was harvested.

Kansas is virtually the only portion of America producing the famous hard red wheat in considerable quantities, in which, as in many other things, the state is unique. The seed of this wheat was introduced about twenty-five years



Wading into the Wheat-field — "Out There in Kansas."

ago, being brought hither by Mennonite immigrants from southern Russia, near the Black sea, who, apparently, understood much better than Americans its hardy productiveness and real value. For years following its introduction, it was disparaged by American millers and grain-buyers, who claimed that its flinty character made it so difficult to grind as materially to lessen its market value. The farmers, however, persevered in sowing it, the production steadily increased, and finally, after much experimentation, millers were successful in economically reducing it to flour, now famous in the world's most exacting markets as superior to nearly all others, wherever made, in America, and conceded equal to those made in Hungary from wheats grown in that country and Bohemia. This is true either for baking alone or for blending with and giving quality to other pretentious makes, represented as particularly choice because made from extra fancy grades of spring wheat grown elsewhere.

These wheats do not continuously retain their peculiar characteristics as well when grown in the extreme eastern and southeastern counties, showing a tendency to assume more the qualities of soft wheats, and this is true, but to a much less extent, wherever they are grown in Kansas. This fact resulted in the importation, direct from Russia, of a ship's cargo of seed, in time for distribution among Kansas farmers for the 1901 sowing. The use of this imported seed, intended to be as perfect as money could buy, should do much towards lessening the chances of any possible deterioration in quality that might otherwise result.

It would be an error, however, to convey the impression that no soft winter wheats are grown in the state, as, in the central and eastern portions, such varieties as Fulcaster, Fultz, Early May and others similar are not uncommon.

Spring wheat is not a prominent item in Kansas agriculture, and its growth is given little or no attention outside a few northern or northwestern counties bordering Nebraska

The following table, compiled from the records of the State Board of Agriculture, shows the acres, product and value of wheat (winter and spring) in Kansas, for each of the years given:

	ACRES.	BUSHELS.	VALUE.
1899	4,988,952	43,687,013	$22,406,410.00
1900	4,378,533	77,339,091	41,974,145.00
1901	5,316,482	90,333,095	50,610,505.75
1902	6,301,040	54,649,236	29,139,490.00
1903	5,964,866	94,041.902	52,426,355.55

That Minnesota is a great wheat state all the world concedes, and, according to the Year-book of the United States Department of Agriculture, Minnesota had in 1900 a considerably larger acreage in wheat than Kansas, but the year book gives on the same page the Kansas yield as greater by more than sixty per cent., and its value greater by forty per cent.; and the years 1901 and 1903, respectively, witnessed the feat repeated with ease and emphasis.

The larger yields per acre in 1903 were in the more westerly counties, and especially in the northwest quarter of the state, Gove reporting an average of 26 bushels (the highest), followed by Decatur with 25 bushels; Lane, 24; Graham, 22; Ness, 22; Norton, 22; Rawlins, 21; and Kiowa, Osborne, Phillips, and Rooks, each 20 bushels.

As a matter of fact, the largest authenticated yield reported for an acre was grown in 1903 by Mr. J. C. Ort, of Gove county, who raised 76 bushels to the acre. Three acres each yielded this quantity, or a total yield of 228 bushels, while his entire area of wheat, 200 acres, all upland, yielded 8230 bushels, or an average per acre of over 41 bushels.

Mr. Ort says: "This land has been in wheat continuously for the past ten years, and no fertilizer has been used except on the three acres mentioned, which was heavily manured. In 1898, on eighty acres, there was a volunteer crop, *i. e.*, no seed sown in the fall of 1897, the land being self-seeded by shattered grains from the preceding harvest, and this yielded an average of 25 bushels per acre.

"On 100 of the 200 acres harvested in 1903, the crop was the fifth in as many consecutive years without the land having been plowed, although it was stirred each year after harvest with a disk.

"The other 100 acres yielded something over 5000 bushels, by weight. The land of this was plowed in August, 1902, about four inches deep, the harrow following the plow. Home-raised seed of the Red Turkey variety was sown with ordinary drill early in September, at the rate of one bushel to the acre, and early in the spring of 1903 the growing wheat was harrowed.

"The preparation of the three-acre tract which yielded so prodigiously was somewhat different. Besides having been manured, it was plowed early in the spring of 1902—some time in May—given more thorough cultivation, and lay fallow until sowing time the following fall, the remaining procedure being identical with that on the larger field. Ordinarily, in this section, I think, it might be inadvisable to manure land for wheat, owing to the tendency of such to dry out, but in 1903 the abundant moisture overcame this drawback, and circumstances combined to produce the phenomenal yields recorded. In an average year here, I am of the belief that land not manured will likely yield the larger crop. I do not pasture my growing wheat.

"I would advise wheat-raising as a specialty in this part of Kansas, particularly for a main, permanent business."

The area reported as probably sown in Kansas for the 1904 crop is 5,671,370 acres, or less by four per cent. A majority of the counties, sixty-three, report the same or increased acreages, but the forty-two returning decreases include many of those which generally have the larger areas. These returns also present a curious and notable coincidence, in that the counties this year producing the highest average yields per acre almost unanimously report the greatest decreases, which is presumably largely on account of lack of sufficient available labor after harvest readily to handle the unusually prodigious crop in those counties and clear the fields in time for the new seeding.

Not all portions of the state are adapted to the best production of wheat, and it is an interesting fact that fifty out of the 105 counties had ninety per cent. of the wheat acreage in 1903, and constitute practically the wheat-field of Kansas. The area sown in the remaining fifty-five counties was about the same as the acreage sown in the two counties of Sumner and Barton. It is likewise of interest to know that practically one-half of the wheat product for 1903 was harvested in seventeen counties, principally in the central third of the state, or the counties of Sumner, Barton, Reno, Rice, Harper, Mitchell, Pratt, Russell, Sedgwick, Stafford, Decatur, Ellis, Kingman, Osborne, Pawnee, Rooks, and Rush. While these counties produced the greater part of the 1903 crop, many other counties harvested a big yield and made a most excellent showing. Counties not adapted to wheat-raising by soil conditions, climate, or from other causes, may be unsurpassed for alfalfa and the sorghums and stock-raising, and their smaller areas in wheat detract nothing from laurels won in other branches of agriculture.

Kansas hard wheats are sought for shipment to mills in other states for mixing with the famous soft wheats from the Northwest, thereby greatly improving the product in the higher flour grades.

For years Kansas flouring-mills have consigned heavy shipments of their products to leading markets throughout the United States and to foreign countries, where they are received with much and increasing favor.

Mill stuffs, such as bran and shorts, find a ready market both at home and abroad, and their feeding value is evident, for they are in constant use on almost every intelligently conducted farm and in the feed-lot, where they have come to be regarded as necessities. Besides the large quantities of these valuable by-products made possible by the wonderful yields of grain, the wheat plant's earlier growth annually affords abundant succulent pasturage for millions of live stock during much of the fall, winter, and spring, which, in itself, is an item of no small consequence; and the straw also is of much value.

A consensus of the detailed statements to the State Board of Agriculture of 120 representative Kansas winter-wheat growers, situated in fifty-five different counties, as to the cost to produce and put in the bin or car an acre crop of wheat, yielding twenty bushels, is itemized thus:

Average cost of plowing (or disking)	$0.96
Harrowing	.28
Seed and seeding	.92
Cost of harvesting and stacking (or shocking)	1.36
Thrashing, and putting in bin or car	1.60
Wear, tear and interest on tools	.29
Rental of land—or interest on its value	1.90
Total cost per acre, or twenty bushels	$7.31

Averages of other items, gathered from those furnishing the 120 most carefully made reports quoted, are as follows:

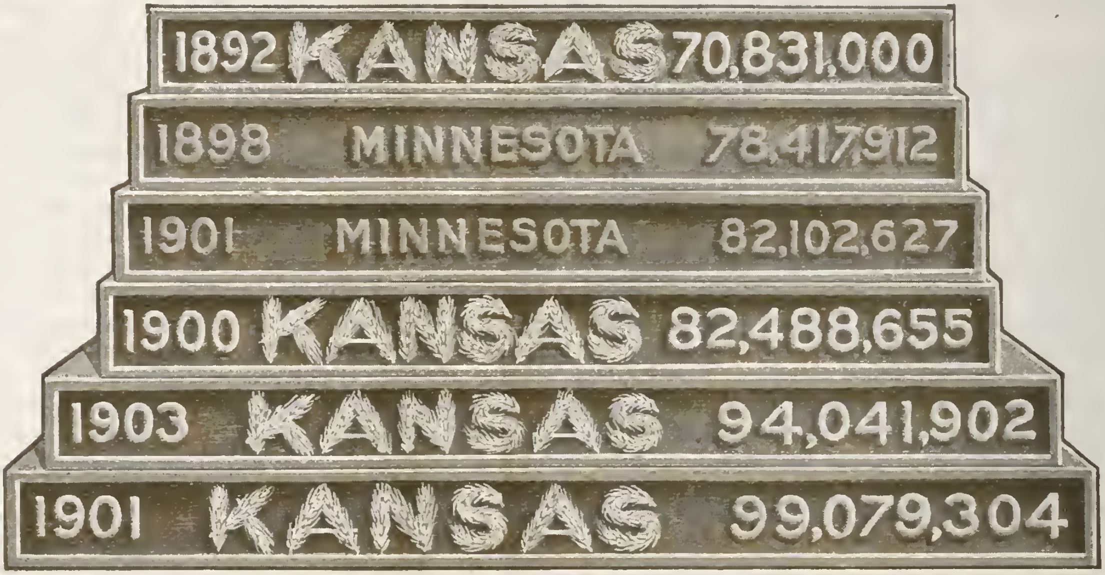
Average number of years these 120 reporters have raised winter wheat in Kansas	19
Average number of acres raised by them annually,	527
Average quantity of seed sown per acre, pecks	4.4
Average yield per acre, bushels	18.2
Average value of wheat land per acre	$24.18
Average value per acre of wheat for pasturage	1.15
Average value of straw per acre	.81

A digest of the same items of information taken from the interviews with eighty growers in the thirty counties constituting what is known as the "wheat belt" which produced 79 per cent. of the 90,000,000-bushel crop harvested in 1901, gives averages thus:

Average cost of plowing (or disking)	$1.00
Harrowing	.28
Seed and seeding	.95
Cost of harvesting and stacking (or shocking)	1.48
Thrashing, and putting in bin or car	1.61
Wear, tear and interest on tools	.27
Rental of land—or interest on its value	2.06
Total cost per acre, or twenty bushels	$7.65

Other averages derived from reports of the thirty wheat-belt counties are as follows:

Average number of years the eighty reporters have raised winter wheat in Kansas	21
Average number of acres raised by them annually during each of these years	613
Average quantity of seed sown per acre, pecks	4.4
Average yield per acre, bushels	18.5
Average value of wheat land per acre	$25.29
Average value per acre of wheat for pasturage	1.07
Average value of straw per acre	.80



From the total cost per acre, as shown in both the foregoing computations, there can rightly be deducted the value of the pasturage and straw, which amount to a considerable sum, and frequently to more than one-third the cost of producing the crop.

Along with other wheat-producing states, Kansas ranks well. The figures of the United States Department of Agriculture are authority for the following comparisons, showing the achievements of the state along this line during the past few years:

In 1895 Kansas was sixth in rank of production, being led by Minnesota, North Dakota, California, Ohio, and South Dakota—these states ranking in the order named. The year 1896 found Kansas ranking third, with a record of 30,794,452 bushels of grain to her credit, Minnesota being first, with 46,599,061, and California second, with 45,097,195 bushels. In 1897 she held second place, with a yield of 47,998,152 bushels, Minnesota winning first place, with a product of 59,891,104 bushels. The yield of 1898 placed Kansas in second rank again, Minnesota getting first honors, with a product of 78,417,912 bushels, while the wheat-fields of Kansas that year produced 64,939,412 bushels, surpassing all her previous wheat crops, with the single exception of the yield of 1892, which, up to that time, was the bulkiest ever grown. In 1899 Kansas was fifth in rank; in 1900 first, with the largest yield ever reported for any state up to that time; in 1901 Kansas retained first rank in the galaxy of wheat states, with a yield surpassing even that of the previous year's crop; and in 1903 Kansas again demonstrated her superiority in wheat-production and premier right to leadership by outyielding any other state. Suggestive of Kansas' achievements as a wheat-raiser and her standing as such, shown by comparison with the largest wheat crops raised by other states, according to the United States Department of Agriculture, the illustration on preceding page affords a most striking example.

CORN

CORN is the king of cultivated plants in Kansas. Grown in profuse luxuriance, this grain proclaims itself the source of wealth and herald of opulence. It is at once the farmer's friend and handmaiden of the stockman's prosperity. Corn proves itself a source of greater wealth and profit in Kansas than any other cultivated grain, and in years of specially favoring conditions its value has often equaled the combined values of all other farm crops. Justly famed as the state's wheat crops have been, statistics reveal that in the past quarter of a century the aggregate value of the corn crop has been nearly double that of the combined yields of winter and spring wheat; and further, that in but few years of the state's history has the value of the wheat crop approached in magnitude or surpassed that of the same year's corn. Great as have been the yields of corn in former years, the most enthusiastic and insistent believer in Kansas resources will not maintain that all portions of the state are well adapted to its successful production. The corn crops of the past thirty years have been grown mainly in the eastern half of the state, and no one pretends that the western third of the state is especially or reliably corn-growing territory.

Usually following extraordinary big yields in any crop there is the next year a larger area devoted to its culture, and doubtless owing to the signal success in recent years in wheat-raising by their neighbors and those in distant sections, many farmers of uncertain stability, and without regard for nature's provisions, hastened to grow more wheat and less corn, hoping to ride to a speedier prosperity *via* that route. This apparently has been a popular movement, but in the end disappointment, it seems, must await those who have no more definiteness of purpose—trailers whose moods are as variant as the seasons, whose course is generally directed only by past successes of others, and in which they had not shared. It is thought this in a measure may account for the smaller corn areas in later years, as statistics show that the total corn area for the last four years was 4,000,000 acres less than that of the four years preceding, while a like comparison of wheat areas records an aggregate increase of 5,500,000 acres. Many, however, who were carried away by the momentum of the wheat avalanche, seemed to have regained their equilibrium, and in 1903 a goodly number of counties, mostly in the eastern part of the state, reported gains in corn areas; which may suggest that the desire recently manifest in parts of this section to sow more wheat is abating, and that many of the counties in the properly corn territory are again assuming more nearly normal corn areas.

The counties most noted for the corn yields lie along the state's northern border. Of these, Jewell is foremost, having raised many large crops, the bulkiest being 10,710,741 bushels, in 1896—more than any other Kansas county ever produced in a single season. The general average for the county was forty-three bushels per acre. In the same year Marshall and Nemaha, neighboring counties further east in the same tier, were next in rank, with yields of 9,012,413 and 8,379,797 bushels, respectively.

In 1903 the six counties leading in corn, and having 5,000,000 bushels or more each, were adjoining and in the northern tier, and, with their yields, according to rank are:

Jewell	6,678,804	Marshall	5,636,439
Washington	5,865,952	Republic	5,234,392
Smith	5,698,548	Nemaha	5,150,375

While other counties in the corn-growing section of the state may more often not be credited with such immense aggregate annual yields as are produced year after year by the counties mentioned above, that is largely due to the fact that their areas are smaller.

The corn crop for the season of 1899 was 225,183,432 bushels, valued on the farms where grown at $53,530,576, while the no mean wheat crop for the same year was valued at $22,406,410, or considerably less than half as much. As indicative of what the corn-producer has been doing of recent years, figures of yield and value for the last decade are given herewith. The yield of 1899 was larger than any other annual yield in the ten-year period named, and, save 1903, the value was likewise greater.

The following table, compiled from the official records of the Kansas Board of Agriculture, gives the annual product and value of corn for the past ten years, together with their totals:

	Bushels.	Value.
1894	66,952,833	$25,354,190
1895	201,457,396	46,189,772
1896	221,419,414	35,633,013
1897	152,140,993	28,555,293
1898	126,999,132	30,298,098
1899	225,183,432	53,530,576
1900	134,523,677	39,581,835
1901	42,605,672	21,731,215
1902	201,367,102	78,321,653
1903	169,359,769	57,078,141
Totals	1,542,009,420	$416,273,786

For thirty-four years, of which we have record, the average yield for the whole area planted, whether in corn territory proper or where none at all grew, was twenty-seven bushels per acre. The average product per acre on all the plantings for ten of those years ranged from forty to forty-eight bushels. For a period of twenty-five years, good and bad, the average farm value of Kansas corn per bushel was 27.2 cents, and per acre, $7.31.

More Corn than his Cribs would Hold — "Out there in Kansas."

Information obtained from numerous extensive and long-time corn-growers in all parts of the state by the Board of Agriculture shows, condensed, the following average cost of the principal items entering into the production and harvesting of an acre of corn in Kansas, reckoning the cost of harvesting as for a yield of forty bushels per acre

Seed	$0.077
Planting (with lister or with check-rower planter, including cost of previous plowing and harrowing)	.780
Cultivating	1.020
Husking and putting in crib	1.160
Wear and tear and interest on cost of tools	.230
Rent of land (or interest on its value)	2.470
Total cost	$5.737
Cost per bushel	.143
Average value of corn land per acre	29.570

The condensed itemized cost showing made by the forty-six growers who reported planting with listers, or who have found that method preferable, is thus:

Seed	$0.075
Listing	.505
Cultivating	1.090
Husking and putting in crib	1.140
Wear and tear and interest on cost of tools	.235
Rent of land (or interest on its value)	2.540
Total cost	$5.585
Cost per bushel	.139
Average value of corn land per acre	28.710

Statements of cost where the land is plowed, well harrowed, and planted with the ordinary check-row machine, summarize for each item as below:

Seed	$0.065
Plowing	1.030
Harrowing	.225
Planting	.245
Cultivating	.965
Husking and putting in crib	1.180
Wear and tear and interest on cost of tools	.233
Rent of land (or interest on its value)	2.370
Total cost	$6.313
Cost per bushel	.158
Average value of corn land per acre	29.370

In none of these calculations has there been made any allowance for the value of corn-stalks, which ordinarily, under the crudest management, should offset the cost of harvesting the grain, and under proper conditions have a forage value much in excess of such cost. Taking these into every estimate, as should rightly be done, the showing of cost per bushel would be very sensibly diminished. In the result of this investigation, it will likewise be noted that the rental for these Kansas corn lands, or the interest figured by their owners on the investment represented, averages more than 8.33 per cent., or a net rate higher than the capitalist, general broker, or money-lender, other than a pawnbroker, dreams of realizing.

It should be understood, however, that the thrifty Kansas farmer does not measure the profit of his corn crop by the narrow margin here shown between the items of "cost" and "value," nor expect more, if he did so, than a moderate return, one year with another, for his labor and investment. It is the conversion of it on the farm into beef, pork, poultry, dairy and similar products from which comes the surplus to make the comfortable homes and build the schoolhouses, colleges and churches that are such common objects on his horizon and so largely a measure of his ambition.

The corn grown in Kansas is of the dent varieties, and the prime objects aimed at are maximum net corn by weight, minimum cob weight, and maximum nutrition. These requirements demand a seed corn, each planted grain of which will germinate and grow, to secure a maximum stand. The aim is at least sixty-two pounds net (shelled) corn to the bushel, and not to exceed seven to eight pounds of cobs. In fact, such corn is now grown to some extent.

The largest authenticated yield reported for an acre was grown by Mr. J. A. Baxter, of Shawnee county, who raised 104 bushels to the acre in 1895. The portion of his crop giving this yield was five acres of a twenty-five-acre field of slightly rolling prairie, not above the average Kansas soil,

Produced in Twenty Years, 3,015,971,073 Bushels, Valued at $810,124,631.

but "with a hard, impervious subsoil." The ground had been planted in potatoes for the preceding two years, and the last crop dug with a listing plow late in October, which was equivalent to a deep fall plowing. Mr. Baxter says: "In the spring the ground was much like a bed of ashes. It was then deeply plowed, for I am a great believer in deep and thorough cultivation, made fine and smooth, and drilled the first week in May with a 'Farmer's Friend' planter of medium width, with a deep-grained yellow dent corn, about the same quantity of seed as would have been used if from three to rather less than four grains had been placed in hills the ordinary distance apart. This was cultivated four times with common gang cultivators and hoed three times, the last being after 'laying by' with the cultivators." For ten years at least no manure or other fertilizer had been used on this land, but it was reported as having been at some previous time heavily manured.

In comparison with other states famous in aggregate of corn-production, Kansas ranks high. The figures of the United States Department of Agriculture are authority for the showing that in 1895 Kansas was fourth, being outranked by Iowa, Illinois, and Missouri, which states yielded in the order named. In 1896 Kansas was again fourth, Iowa again leading, Nebraska second, and Illinois third. The year 1897 finds Kansas back in fifth place, Nebraska, Illinois, Iowa and Missouri coming in the order mentioned. In 1899 Kansas was third, Illinois and Iowa each barely preceding her, and in 1900 Kansas again ranked fifth. In 1901 she ranked seventh, and in 1902 she was back in the fifth place. From these statements, it will be gathered that the states excelling Kansas in total corn-production are her immediate neighbors of the prairie district. During these recent years, except one, Kansas has ranked fifth or better, and, with the distinguished Illinoisan who gave utterance to the following, Kansans can exclaim:

"Majestic, fruitful, wondrous plant! The corn triumphant, that with the aid of man hath made victorious procession across the tufted plain, and laid foundation for the social excellence that is, and is to be. This glorious plant, transmuted by the alchemy of God, sustains the warrior in battle, the poet in song, and strengthens everywhere the thousand arms that work the purposes of life.

"Aye, the corn,
The royal corn,
Within whose yellow heart
There is of health and strength
For all the nations."

LIVE STOCK

THERE is probably no other territory of like dimensions where live stock of all kinds grows and fattens to greater perfection, or where climatic and others conditions are more favorable to their profitable rearing, or where all the natural advantages are more conducive to their health, than in Kansas. The same wholesome, invigorating air and genial sunshine with which Kansas is blessed, so widely sought by and so beneficial to mankind, are likewise of inestimable value and importance to animal life and growth. Here are the grains and fodders, grown in wonderful profusion, and with the luxuriant pastures, pure water, mild winters, and nearness to market, are combinations making Kansas preeminently a live-stock region. Statistics substantiate all this, and, according to figures collected and compiled by the State Board of Agriculture, it is shown that there has been from her beginning a most gratifying advance made in the animal population, and, owing to the intelligence and enterprise of her farmers and stockmen, there has likewise been remarkable improvement, until to-day, both in numbers and superior breeding

A Foremost Horse of all the Ages.

of farm animals, the state occupies an exalted and enviable position.

Kansas ranks high and favorably among the states in the number of horses, milch cows, other cattle, and swine. While in sheep some may excel in mere numbers, there are none whose flocks of fine wools are more favorably known among breeders, wool-buyers and wool manufacturers for large yields and superior quality of product than those reared here, and famed far and wide for heavy fleeces of fine texture and innumerable winnings of prizes over world-defying competition. The heaviest authenticated year's growth of wool, by seven and one-half pounds, ever shorn was taken from a four-year-old Kansas Merino ram, weighing, without artificial weighting, fifty-two pounds. It also seems to be a fact that the heaviest eight fleeces, aggregating 301½ pounds, ever sheared from a sheep in eight consecutive years, were produced by a Kansas ram, making a yearly average of 37.7 pounds; a ewe in this same flock sheared an aggregate of 154¼ pounds of wool in six fleeces, which is believed to be the heaviest yield ever obtained for a ewe in six consecutive years, in two of which she produced consecutively the two heaviest fleeces ever taken from one of her sex, being 32¼ and 31¾ pounds, respectively. These were all Merinos, but profitable flocks of the various mutton breeds are also maintained.

While the United States Department of Agriculture ranks Kansas as fourth in the number of horses, if there was any comparison made in excellence, those of the Sunflower state would in all probability stand among the first. Some of the horses most noted for speed, endurance, and striking excellence, marvels of the equine world, and matchless, have been foaled or reared beneath the sunny skies of Kansas. The pacing stallion, John R. Gentry, 2:00½, was foaled in Sedgwick county, Kansas, as was his only rival, Joe Patchen, 2:01¼, in Marion county, Kansas; and the present pacing champion and premier harness horse of the world, the famous Dan Patch, young, sound, and promising even yet greater achievements, already having a record of 1:56¼, is the worthy son of a Kansas-bred-and-reared sire, the mighty Joe Patchen, "the iron race-horse." Smuggler, 2:15¼, one of the greatest trotters of his time, was reared and developed in Kansas, as was Joe Young, 2:18, the grandsire of Joe Patchen; while the one-time trotting champion, Cresceus, 1:59¾, is likewise indebted to a Kansas parentage, his sire, Robert McGregor, 2:17½, having his home in Shawnee county during his best years. All these represent types of the harness or roadster class. Perhaps, however, wider attention is given to the breeding of the types especially adapted to draft and similar purposes, and in the past few years renewed and added interest in this particular industry has been apparent. March 1, 1903, there were 845,404 horses in the state, valued at $63,405,300; also, of mules and asses, 101,089 head, worth $8,895,832.

Baby Lord (from a photograph).

A Kansas-bred American Merino, whose fleece of 52 pounds, of 12 months and 16 days' growth, surpassed the world's record by 7½ pounds. He sheared as a two-year-old, 37½ pounds; three-year-old, 44¼ pounds; four-year-old, 52 pounds. Weight of ram after shearing, 120 pounds.

Kansas Mortgage-lifters.

The state's greatest animal wealth lies in her herds of cattle and swine, which year after year steadily bring to their producers a profitable recompense for intelligent industry. The latest official statistics show the number of stock cattle now to be the largest in the history of the state, making within the last five years an increase of nearly forty per cent., while the number of all cattle is more than 3,500,000, mostly grades of the best breeds, and valued at $76,585,646; and the 1,770,585 hogs on hand March 1, 1903, were valued on the farms at $14,164,680.

The following table shows the aggregate value of the live stock in Kansas for each of the last five years:

1899	$133,057,092
1900	143,457,753
1901	152,699,716
1902	155,107,412
1903	163,552,590
Total	$747,874,563

An Easy Way of Beef-making—"Out There in Kansas."

By nature Kansas is made a superb fattening ground for live stock of all kinds. With her numerous varieties of grains and grasses, some one or more of them being especially adapted to and prospering in the dissimilar conditions of the different localities, the state each year is practically assured of a well-nigh unlimited supply of the very best meat-producing foods, which are largely and profitably marketed *via* the live-stock route. Animals slaughtered for meat or sold for that purpose alone represented nearly $55,000,000 in the year ending March 1, 1903; and annually for the past ten years Kansas has given to the shambles animals having an average home value of nearly $48,000,000, or an aggregate of over $478,006,816. In this connection, it is entirely just and proper to correct an erroneous impression that has somehow become widespread, and that is, that the great stock-yards and gigantic slaughter- and packing-houses of Kansas City, with one exception the most extensive in the world, located in, maintained and made possible by the state of Kansas, are not now and never were in Missouri, as many are led to believe, but in Kansas City, Kan., the state's metropolis. As a matter of fact, the latest available statistics show that in a chosen year Kansas furnished six times as many as her closest competitor, and often more and very seldom ever less than 50 per cent., of the entire number of cattle received at the Kansas City stock-yards each year, not to speak of sheep and swine.

The helpful hen has also been unfailing in her substantial contributions to the state's wealth, and the amounts received each twelve months from the surplus of poultry and eggs have increased, until in 1903 it reached $6,498,856, or a sum that would have considerably more than paid the total expense of the excellent school system for the same time.

As Kansans are beginning more fully to comprehend the natural advantages with which they are endowed for the rearing of live stock, the breeders of the state are strongly supplementing the benefactions of a kindly Providence by themselves providing the best basis available upon which to build—*i. e.*, better blood—which means better returns from their grasses and grains so abundantly produced at the minimum cost, and which are devoured alike by the scrub, the high grade, and pure-bred, but with much less profit by the scrub. This demand for better blood is made still more apparent by the fact that at the 1902 American Royal Live-stock Show, at Kansas City, where Kansas breeders were prominent exhibitors of high-class animals of each of the leading beef breeds, Kansans were among the most liberal purchasers of desirable pure-breds. In a report of this show by a prominent Kansas City live-stock journal is found the following: "Kansas did herself proud at the sales of the four breeds of beef cattle by taking 105 out of a total of 308 head. Her purchases of Angus, Short-horns, Herefords and Galloways were alike liberal. In Short-horns and Galloways she bought more than any other state." Also: "Kansas furnished the bulk of the buyers for the Galloways, over half of the sale cattle going to the sunflower state. Kansas purchasers paid a little more per head for their stock than did Iowans." And further, Kansas also captured at this show the silver trophy cup for the best car lot of cattle, awarded on a load of range-bred pure Galloways, sent by Ellsworth county parties.

With such determination and spirit as that diplayed at the Kansas City 1902 Royal, it is not surprising that Kansas breeders and feeders are now making a record of which many older commonwealths might rightly feel envious, and this era of greater improvement has just begun.

The figures in the table below, showing for the last five years the total value of the products of Kansas live stock, to wit: animals slaughtered or sold for slaughter, wool clip, butter and cheese manufactured, and poultry, eggs and milk sold, disclose a marvelous record:

1899	$61,525,551
1900	67,014,901
1901	74,706,299
1902	65,695,331
1903	69,865,095
Total	$338,692,427

The 1903 gain over the value in 1899 is $8,339,544, or fourteen per cent. The value of live stock on hand March 1, 1903, was $163,552,590; the value of live-stock products for the year, $69,865,095.

These figures well suggest the significance of live-stock and meat production as factors in Kansas agriculture and Kansas prosperity.

A Bunch of Four Thoroughbreds — "Out there in Kansas."

Improved Live-stock Breeders.

ONE of the most potent factors in furthering the interests of the state's animal industries and interests is, and has been, the Kansas Improved Stock-breeders' Association, organized in 1890, said to have a larger active membership of up-to-date, progressive breeders than any other like organization in America. A large measure of Kansas' prestige in the various lines of advanced animal husbandry is due to the intelligent cooperation of the gentlemen composing this organization.

Among those who are members of this association and actually engaged in the business of breeding pure-bred animals are the following, classified according to kind and breed of stock handled, with their post-office addresses, as furnished by the association's secretary, H. A. Heath, Topeka:

SHORT-HORN CATTLE.

Aaron, Gus, Leavenworth.
Abplanalp, H. W., Burns.
Adair, J. C., North Topeka.
Anderson, James, Leonardville.
Ashcraft, A. M., Atchison.
Aufdenberge, Henry, Lincoln.
Babb, M. W. & Son, Attica.
Babst, Thos. P. & Sons, Auburn.
Bachelder, H. E., Fredonia.
Baird, Dr. O. W. & Son, Marquette.
Ballantyne, D., Herington.
Bayer, J. H. & Son, Yates Center.
Bean, J. W., Lindsborg.
Bell, E. F., Wilsey.
Bell, L. B., Winchester.
Benedict, Eli, Medicine Lodge.
Benedict, S. S., Benedict.
Brinkman & Peck, Great Bend.
Broderick, Case, Holton.
Brookover, H. G., Eureka.
Brown, Frank, Carbondale.
Brown, T. C. & Bros., Hackett.
Buck, R. M., Eskridge.
Burdick, D. B., Carbondale.
Camp, Oliver C., Eudora.
Campbell, F. B., Altamont.
Chacey, A. P., North Topeka.
Channon, Geo., Hope.
Chapple, Wm., Troy.
Clark, C. H., Colony.
Clark, H. B., Hope.
Clark, J. A., Topeka.
Clark, Waldo E., Junction City
Clark & Clark, Fredonia.
Clarke, D. M., Fredonia.
Conger, F. H., Yates Center.
Conner, F. B., New Lancaster.
Cook, Geo. W., Dover.
Cook, Porter S., Meriden.
Cooke, Frank P., Beloit.
Copeland, J. M., Glasco.
Cottingham, W. W., McPherson.
Cowley, Fred, Columbus.
Cross, J. W. S., Plainville.
Cnrrie, Chas., Olsburg.
Darling, Jack, Hoyt.
Davis, J. L., Frankfort.
Davis, Thos. J., Nickerson.
Dawdy, D. L., Arrington.
Dean, Calvin, Newkirk, Okla.
DeGreer, J. W., Deerhead.
Deming Ranch, Oswego.
Denton, W. W., Purcell.
Disney, L. M., Monmouth, Ill.
Dixon, Edw., Parsons.
Dowling, Wm. R., Norcatur.
Drake, C. K., McPherson.
Duhen, Oscar, Clements.
Dunham, W. W., Fredonia.
Eagle, Chas. S., Topeka.
Ellis, V. R., Gardner.
Ely, James, Aulne.
Engle, J. P., Alden.
Enos, A. R., Morrill.
Evans, Harry, Pleasanton.
Fleisher, W. A., Hoyt.
Forbes, H. T., Topeka.
Fulton, J. M., Argonia.
Furneaux, R. O., Moran.
Gabler, Jas., Scranton.
Gaddis, A. & Son, McCune.
Gallagher & Myers, Highland Sta.
Garrison, A. B., Beattie.
Gifford, Fred M., Milford.
Goodman, Jas. R., Norcatur.
Goodrich, C. B., Topeka.
Gorges, M., Colwich.
Gowdy, B. W., Garnett.
Graner, W. H., Lancaster.
Graves, S. W., Inman.
Gregg, Jas., Seneca.
Griffin, J. E., Naponee, Neb.
Gwin, N. A., Lawrence.
Hanna & Co., Howard.
Hanna, W. S., Pomona.
Harrington Bros., Clearwater.
Harrington, E., Baker.
Hastings, J. H., Edgerton.
Haub, Henry, Whiting.
Hawk, W. B. & M., Beattie.
Heath, A. B., Republican, Neb.
Hemenway, M. C., Hope.
Henderson, M. E., Berryton.
Hill, H. M., LaFontaine.
Hoover, J. C., Gardner.
Huber, H. E., Meriden.
Hull's Sons, L. B., Pomona.
Hunt, Thomas, Blue Rapids.
Hunter, W. E., Mitchell.
Huse, A. F., Manhattan.
Hyde, J. C., Topeka.
Johnson, G. Y., Willis.
Jordan, A. C., Lyons.
Keats, O. N., Horton.
Kellerman, Geo. F., Mound City.
Kelley, G. W., Detroit.
Kerr, Geo., Sabetha.
King, Joseph, Potwin.
Kingsley, F. C., Dover.
Kirkpatrick, E. S., Wellsville.
Knapp, E. L., Maple Hill.
Lahr, Jas. P., Sabetha.
Landis, J. E., Abilene.
Langley, S. P., Morland.
Lantis Bros., Sedgwick.
Lenhert, S. H., Hope.
Lewis, A. D., Lyndon.
Lieb, H. A., Westphalia.
Lind, Peter M., Saffordville.
Little, H. R., Hope.
Low, M. A., Topeka.
Lowe, J. R., Erie.
Ludwig, E. D., Sabetha.
Lunt, Harry E., Burden.
McAfee, H. W., Topeka.
McAfee, Gen. J. B., Topeka.
McArthur, Cecil, Walton.
McCandless, J. C., St. John.
McCoy, John, Sabetha.
McIntosh, J. S., Kansas City, Mo.
McKinney, F. G., Great Bend.
McKittrick, P. H., McCracken.
McNoun, I. A., Leeds.
Makin, F. E., Cimarron.
Manrose, N., Ottawa.
Marshall Bros., Burden.
Mason, J. C., Frankfort.
Matti Bros., Cottonwood Falls.
Mead, L. A., Carbondale.
Miller, W. H., Ness City.
Montgomery, R. B., Burlingame.
Morse, O. E. & Son, Mound City.
Mull, A. B., Iola.
Myers, J. W., Galva.
Nelson, J. K., Sycamore Springs.
Nevius, C. S., Chiles.
Nichols, M. K., Horton.
Norton, O. P., Dunlap.
Olson, C. P., Kensington.
Osburn, M. F., Keats.
Osthoff, Fred, Stippville.
Page, David G., Topeka.
Parsons, L. F., Salina.
Parsons, S. E., Brookville.
Pringle. Andrew, Eskridge.
Prosser, A., Latham.
Purviance, R. H., Erie.
Rait, A. C., Junction City.
Ransom, Wm. H., North Wichita.
Reisner, J. H., Atchisou.
Rhodes Bros., Wellsville.
Rippey, W. D., Severance.
Robbins, W. A., Agricola.
Robison, J. W. & J. C., Towanda.
Rockefeller, Frank, Belvidere.
Ross, Geo. B., Alden.
Rush, Geo. W., Erie.
Sailors, T. C., Erie.
Sands, J. P., Plainville.
Savage, W. J., Russell.
Schlatter, J. K., McPherson.
Scott, Ernest, Burlingame.
Scott, Louis, Marysville.
Seal, Jos., Wakefield.
Seaton, John A. & Son, Vernon.
Shaffer, Chas. M., Milan.
Shannon, J. M., Vernon.
Shaw, N. F., Plainville.
Sherman, J. H., Peck.
Sherman, M. M., Geneseo.
Shideler, Henry, McCune.
Shinn, A. C., Ottawa.
Shoemaker, W. H., Narka.
Sidle, D. N., Winfield.
Slason, Chas. C., Plainville.
Slason, G. F. & Son, Plainville.
Slavens, Dr. H. G., Neosho Falls.
Smith, John B., Wellsville.
Smith, G. K., Lincoln.
Smith, W. H. & E. O., Emporia.
Snodgrass, W. J., Gordon.
Snyder Bros., Winfield.
Sponsler, A. L., Hutchinson.
Staadt, J. F., Pomona.
Stanley, Jas. D., Horton.
Stenger, Frank L., Carbondale.
Stewart, O. H., Parsons.
Stockstill, T. B., Sharon.
Stodder, J. F., Burden.
Stratton, G. D. & Son, Walton.
Strickler, J. F., Highland Station.
Strong, J. C., Moran.
Stunkel, Henry, Peck.
Sumpter, F. M., Argonia.
Swoyer, Sam. & Son, Winchest[illegible]
Symns, A. B., jr., Atchison.
Taylor, C. W., Pearl.
Taylor, W. W., Sawyer.
Tennyson, D., Frankfort.
Thisler, O. L. Chapman.
Thomas, H. A., Scranton.
Thorn, John J., Kinsley.
Tipton, W. S., Marion.
Tomson, T. K. & Son, Dover
True, J. F. & Son, Perry.
Tudor, H. O., Holton.
Van Nice, D. C., Richland.
Van Orsdal, T. P., Silver Lake.
Vansell, M. C., Muscotah.
Van Riper, A., Arlington.
Wales, Wm., Osborne.
Waltmire, M. & Son, Carboudale.
Walton, J. B., Sibley.
Warner, John, Manhattan.

Watkins, J. A., Whiting.
Watson, J. S., Emporia.
Webster, R. C., Utica.
Weidling, Carl, Topeka.
Weidmeyer, H. E., Marysville.
Weiss, H. W., Westphalia.
White, W. H., Council Grove.
Wolf, C. F. & Son, Ottawa.
Woodworth, E. R. & Son, Walnut.
Wyckoff, Preston, Corbin.

ABERDEEN-ANGUS CATTLE.

Altemus Bros., Strong City.
Anderson & Findlay, Iola.
Avery, G. E., Milford.
Avery, Walter, Wakefield.
Beal, C. G., Hamilton.
Berry, E. A., Waterville.
Dietrich, W. J., Carbondale.
Drummond, Geo., Elmdale.
England, W. M., Callao, Mo.
Frater, Jas., Fredonia.
Halbleib Bros., Brownell.
Hewitt, E. J., El Dorado.
Jacobitz, A., Marion.
Knobb & Dowell, Hiawatha.
Langley, S. P., Morland.
Lawrence, R. E., Wichita.
Lowe, J. L., Erie.
McCreary, J. T., Highland.
McNutt, W. R., Woodston.
Miller, Willard A., Peoria.
Milton, R. L., Stafford.
Myers, E. S., Chanute.
O'Tool, Thos., Banner.
Parrish & Miller, Hudson.
Patterson, L. H., Keats.
Skinner, A. G., Aliceville.
Stevenson, Geo., jr., Waterville.
Sutton, Chas. E., Russell.
Van Voorhees, F., Tonganoxie.
Wagner Bros., Enterprise.
Walbridge, L. C., Russell.
Williams, M. T., Caldwell.
Wynkoop, A. L., Bendena.

HEREFORD CATTLE.

Akin, D. D., Marion.
Barnes & Bircher, Pratt.
Bartlett, Dean, St. Marys.
Becker Bros., Cottonwood Falls.
Bird, A. H., Axtell.
Bommer, Wm., Marietta.
Bowman, S. A., Council Grove.
Brougher, Ira D., Great Bend.
Carpenter, J. A., Carbondale.
Cattell Bros., Yorktown.
Clark, H. B., Geneseo.
Close, Phil, Roper.
Condell, Jos. & Son, El Dorado.
Cottrell Bros., Irving.
Cowan, Fred. Lost Springs.
Cross, Mrs. C. S., Emporia.
Cummings, W. J., Clinton.
Dawson, Geo. E., Clements.
Deming Ranch, Oswego.
Dick, G. G., Ozawkie.
Diesem, I. L., Garden City.
Dillon, A., Hope.
Drennan, John, Blue Rapids.
Drybread, Sam'l, Elk City.
Eagle, E. A. & Son, Rosemont.
Eder, S. G., Stilwell.
Emmert, Geo. S., Blue Rapids.
Erickson, E. H., Olsburg.
Evans, Thos., Hartford.
Evers, A. L., Dillon.
Faulkner, Frank J., Marysville.
Filson, E. L., Healy.
Foetisch, Chas. H., Chanute.
Forbes, H. M., Arkalon.
Foster, J. M., Topeka.
Fox, David, Atlanta.
Geist, Jos., Thayer.
Gideon, T. H., Adrian.
Giese, F. A., Norwich.
Gill, Pearl I., Great Bend.
Goodwin, Miss Lou, Blue Rapids.
Guild Bros., Sabetha.
Hanson, Thos., Burns.
Hazlett, Robt. H., El Dorado.
Hedderman, H., Topeka.
Heritage, L. T., Emporia.
Hildreth, O. A., Arcadia.
Hill, O. L., Topeka.
Hodgins, H. A., Topeka.
Holderman, M., Chetopa.
Hollinger, A. L., Pearl.
Hornaday, Grant & Co., Ft. Scott.
Howe, J. H. & Son, Emporia.
Hussey, Geo. W., Glasco.
Jacobs, A. A., Neosho Rapids.
Jacob, J. & Sons, Neosho Rapids.
Johnson, August, Clearwater.
Johnson, Chas. M., Caldwell.
Johnson, L. F., Geuda Springs.
Jones Bros., Comiskey.
Jordan, F. B., Severy.
Kelly, M. A., Bucyrus.
Klaus Bros., Bendena.
Landon, W. P., Cunningham.
Larson, J. A., Everest.
Larson, L. P., Powhattan.
Lind, Peter M., Saffordville.
Linder, D. W., Hoisington.
Maiss, R. S., Ness City.
McBrown, Wm., Fall River.
McCarty, A. F., Humboldt.
Menke, D. R., Garden City.
Miller, W. A., Council Grove.
Molzen, N., Newton.
Monroe, Hooper, Frederick.
Moore, W. A. C., Auburn.
Mosely & Zisch, Dillon.
Moses Bros. & Clayton, Gt. Bend.
Moss, S. J., Melvern.
Naber, H. A., Wallula.
Neal, J. L., St. John.
Nelson, O. F., Hiawatha.
Peairs, C. E., Anness.
Pendleton, E. P., Richmond.
Perkins, Chas. S., Oswego.
Perkins, Fred, Oswego.
Powell W. S., Moline.
Powers, Hale P., Junction City.
Preston, F. W., Irving.
Rhodes, Will H., Tampa.
Richards, John S., Olsburg.
Rockefeller, Frank, Belvidere.
Samuelson Bros., Cleburne.
Sands, J. P. & Sons, Walton.
Satzler, H. M., Burlingame.
Scholtz, Chas. A., Frankfort.
Shields, J. B., Lost Springs.
Skidmore, F. F., Tescott.
Slawson, M. G., Girard.
Sloan, Wesley, Wellsville.
Solt Bros., Barnes.
Stahl, Frank M., Auburn.
Stannard, C. A., Emporia.
Stauffer & Dreany, La Crosse.
Stockwell, Jas. R., Effingham.
Steele Bros., Belvoir.
Stewart, O. H., Parsons.
Stinson, Frank R., Phillipsburg.
Stout, W. C., Arkalon.
Sullivan, L. H., Cedarvale.
Sutor Bros., Zurich.
Taylor, D. L., Sawyer.
Tibbles, Wm., Haddam.
Trusler, Dr. L. S., Fall River.
Turner, D. V., Frederick.
Vilander, Magnus, Cleburne.
Wampler, J. W. & Son, Brazilton.
Wertsberger, Seb., Volland.
West & Wilson, Silver Lake.
White, W. H., Council Grove.
Whiting, J. W., Kelso.
Williams, Jas. M., Home.
Wilson, R., Hoyt.
Winter, B. M., Irving.
Woodburg, H. B., Cawker City.
Woodman, E. E., Vermillion.
Zeigler, F. T., La Harpe.

RED POLLED CATTLE.

Blair, Wilkie, Girard.
Blocher, Peter, Richland.
Brown, A. Z., Guilford.
Burtis, Walter J., Fredonia.
Butler, Geo. C., White City.
Christian, Volla, Clyde.
Entsminger, A. L., Silver Lake.
Foster, Chas. & Son, Foster.
Gilbert, R. L., Lawrence.
Grim, B. E., Wa Keeney.
Groenmiller, Geo. & Son, Pomona.
Hinshaw, John E., Emporia.
Hose, John G., Clyde.
McGregor, Robt., Morrowville.
Morrison, Chas., Phillipsburg.
Pellett, H. L., Eudora.
Robbins, Leon, Rose.
Stainbrook, Daniel, La Cygne.
Thomas, H. A., Freeport.
Van Buskirk, D. F., Blue Mound.
Weidling, Carl, Topeka.
Young, Otto, Utica.

GALLOWAY CATTLE.

Ambler, A., Fall River.
Bartlett, Dean, St. Marys.
Blackshere Bros., Elmdale.
Bradshaw, Chas., Wallace.
Butterfield, J. W., Mulvane.
Clark, S. G., Belpre.
Croft, S. M. & Son, Bluff City.
Darrow, J. A., Heber.
Goodrich, J. S., Goodrich.
Kellam, Geo. M., Topeka.
Matson, O. E., Furley.
McCandless, W. G., Cottonwood Falls.
McDonald, W. M., Girard.
Siegrist, H. & C. S., Lenexa.
Smith, W. A., Walker.
Stephens, Wm., Oswego.
Thrall, E. W., Eureka.
Wear, Jos., Barnard.
Wiggins, Van B., Lyle.

POLLED DURHAM CATTLE.

Achenbach Bros., Washington.
Albright, C. M., Overbrook.
Broderick, Case, Holton.
Graham, A. L., Quenemo.
Hoover, J. L., Gardner.
McKinney, F. G., Great Bend.
Rockefeller, Frank, Belvidere.
Schletzbaum, Francis, Huron.
Smith, C. K., Lincoln.
Snyder Bros., Winfield.
Van Nice, D. C., Richland.

HOLSTEIN-FRIESIAN CATTLE.

Beach, J. M., Maple Hill.
Cowles, H. B., Topeka.
Holdeman, H. N., Girard.
Melville, E. W., Eudora.
Orr, D. O., Topeka.
Stone, C. F., Peabody.
White, Alvin J., Topeka.
Witschy, John, Fairview.

JERSEY CATTLE.

Babcock, M. S., Nortonville.
Brown, Wm. & Sons, Lawrence.
Henry, H. E., Douglass.
Maffet, Geo. W., Lawrence.
Raymond, E. O., Council Grove.
Swingle, C. G., Manhattan.
Zimmerman, Fred, Moray.

BROWN SWISS CATTLE.

Cool, J. W., Columbus.

STANDARD-BRED HORSES.

Adams, L. P., Howard.
Albright, P. H., Winfield.
Axtell, Dr. J. T., Newton.
Bell, E. F., Wilsey.
Cowdrey, R. E., Topeka.
Creech, J. W., Herington.
Dorsey, Ed. R., Girard.
Dunaway, Wilson M., Rossville.
Griffin, J. E., Naponee, Neb.
Hanson, Robert, Jamestown.
Hoover, Frank, Columbus.
Kenoyer, G. A., Leon.
King, Joseph, Potwin.
Kreipe, R. T., Topeka.
Lee, R. I., Topeka.
Low, M. A., Topeka.
Maffet, Geo. W., Lawrence.
McCarter, W. A., Topeka.
Orr, D. O., Topeka,
Peck, Jno. A., Tecumseh.
Pritchard, Dr. Geo. C., Topeka.
Raymond, E. O., Council Grove.
Reed, Ed E., Burden.
Richards, Dr. W. H., Emporia.
Rohrer, S. B., Topeka.
Samson, C. H., Topeka.
Shinn, A. C., Ottawa.
Sutton, Chas. E., Russell.
Terry, T. H., Bavaria.
Updegraff, O. P., Topeka.
Van Voorhees, F., Tonganoxie.
Weidemeyer, H. E., Marysville.
Wilkin, Jno. S., Maple City.

PERCHERON HORSES.

Albright, C. M., Overbrook.
Avery & Son, Wakefield.
Bartlett, Dean, St. Marys.
Close, Phil, Roper.
Collins, J. M., Welda.
Corson, O. J., Potter.
Cottingham, W. W., McPherson.
Davis, H. M., Thayer.
Dunaway, Wilson M., Rossville.
Groenmiller, Geo. & Son, Pomona.
Hanna & Co., Howard.
Hewitt, E. J., El Dorado.
Hill, O. L., Topeka.
Holdeman, H. N., Girard.
Hurst, Garrett, Zyba.
King, Joseph, Potwin.
Miller, Willard A., Peoria.
Moyer, L. E., Junction City.
Raymond, E. O., Council Grove.
Richards, Dr. W. H., Emporia.
Robison, J. W. & J. C., Towanda.
Schrepel, F. H., Ellinwood.
Snyder Bros., Winfield.
Spohr, C., Rome.
Sutton, Chas. E., Russell.
Terry, T. H., Bavaria.
Thisler, O. L., Chapman.
Tredway, J. T., La Harpe.
Warner, John, Manhattan.

SADDLE HORSES.

Bell, J. W., Topeka.
Blackshere Bros., Elmdale.
Burton & Burton, Topeka.
Dunaway, W. M., Rossville.
Foster, J. L., Independence.
Holderman, M., Chetopa.
Keats, O. M., Horton.
Kreipe, R. T., Topeka.
Low, M. A., Topeka.
McAfee, H. W., Topeka.
True, J. F. & Son, Perry.
Warner, John, Manhattan.

COACH HORSES.

Jordan, F. B., Severy.
McCarter, W. A., Topeka.
Richards, Dr. W. H., Emporia.
Thisler, O. L., Chapman.
Wear, Jos., Barnard (Oldenburg.)

CLYDESDALE HORSES.

Gregg, Jas., Seneca.
McAfee, H. W., Topeka.
Rush, Geo. W., Erie.

ENGLISH SHIRE HORSES.

McAfee, Gen. J. B., Topeka.
Peacock, W. R., Sedgwick.

CLEVELAND BAY HORSES.

Dorsey, Ed. R., Girard.
Hammond, W. C., Argonia.

JACKS.

Corson, O. J., Potter.
Hanna & Co., Howard.
Lantis Bros., Sedgwick.
Poos, F. W., Potter.
Spriggs, S. A., Westphalia.
Walker, Philip, Moline.

POLAND-CHINA SWINE.

Aaron, Gus, Leavenworth.
Abbott, Lew A., Wamego.
Altemus Bros., Strong City.
Anders, E. J. & Son, New Salem.
Appleby, L. H. & Son, Formosa.
Ambler, A., Fall River.
Arndt, Herman, Templin.
Arnold, L. D., Salina.
Ayers, E. S., Eudora.
Babb, M. W. & Son, Attica.
Babcock, M. S., Nortonville.
Baird, W. F., La Cygne.
Barrington, F. H., Spring Creek.
Bean, J. W., Lindsborg.
Becker, J. H., Newton.
Bell, L. B., Winchester.
Berry, E. A., Waterville.
Bigelow, J. S., Coffeyville.
Biles, J. C., Chanute.
Blair, Geo. A., Mulvane.
Blair, Wilkie, Girard.
Blosser, Adam, Bolton.
Bolin, E., Leloup.
Bolken, Harry, Moran.
Bollin, John, Leavenworth.
Braunsdorf Bros., Parsons.
Brown, T. C. & Bros., Hackett.
Brown, Wm. & Sons, Lawrence.
Buck, R. M., Eskridge.
Burtis, Walter J., Fredonia.
Calhoun, Leon, Potter.
Cheney, H. W., Topeka.
Clark, C. H., Colony.
Clark, J. A., Topeka.
Clark, S. G., Belpre.
Collins, J. M., Welda.
Cook, Porter S., Meriden.
Cook, David, Washington.
Cook, Frank P., Beloit.
Cool, J. W., Columbus.
Cooper, J. T., Altoona.
Cottingham, W. W., McPherson.
Cottingham, H. W., Topeka.
Cottrell Bros., Irving.
Crawford, John, Lebanon.
Curry, Chas., Olsburg.
Davis, H. M., Thayer.
Dawdy, D. L., Arrington.
Dawley, F. A., Waldo.
Dawson, W. A., Iola.
Dawson, W. T., Topeka.
Deming Ranch, Oswego.
Dietrich & Spaulding, Richland.
Dille, A. B. & Son, Edgerton.
Dorsey, Ed. R., Girard.
Dowling, Wm. R., Norcatur.
Dowell, John A., Robinson.
Elder, J. M., Green.
Elm Beach Farm, Wichita.
England, W. M., Callao, Mo.
Enos, A. R., Morrill.
Evans, Harry, Pleasanton.
Evans, Thos., Hartford.
Evans, D. W., Fairview.
Fleisher, W. A., Hoyt.
Foster, J. L., Independence.
Fuller, L. P., Morrowville.
Gallup, Geo. & Sons, Blue Rapids.
Garrison, A. B., Beattie.
Garver, C. M. & Son, Abilene.
Goode, W. P., Lenexa.
Goodman, Jas. R., Norcatur.
Gorges, M., Colwich.
Greer, John B., Marion.
Guy, Frank E., Oberlin.
Hamblin, C. G., Altoona.
Hammond, W. T., Portis.
Hanss, E. E., Towanda.
Hanselman, G. H., Lenora.
Hanna, W. S., Pomona.
Harman, G. W., Ridge.
Harrington, E., Baker.
Hastings, J. H., Edgerton.
Haub, Henry, Whiting.
Hawk, W. B. & M., Beattie.
Hemenway, M. C., Hope.
Henderson, M. E., Berryton.
Herbage, M. L., Dana.
Herr, Allen E., Kiowa.
Hewitt, E. J., El Dorado.
Hoagland, J. E., Holton.
Hoffman, Chas, S., Perry.
Holdeman, H. N., Girard.
Holderman, M., Chetopa.
Hoover, Frank, Columbus.
Hose, John G., Clyde.
Howey, V. B., Topeka.
Hubbard, T. A., Rome.
Huber, Christ, El Dorado.
Huggins, C. J., Wamego.
Hull's Sons, L. B., Pomona.
Hunt, Thomas, Blue Rapids.
Hunter, W. E., Mitchell.
Huse, A. F., Manhattan.
Jordan, A. M., Alma.
Johnson, R. R., Erie.
Jones, Dr. F. W., Earlton.
Kelley, Geo. W., Detroit.
Killough, J. R. & Son, Ottawa.
Kilmer, M. O., McPherson.
Kirkpatrick, H. M., Wolcott.
Kirkpatrick, J. N., Richmond.
Klaus Bros., Bendena.
Knowlton, E. J., Alden.
Kolterman, Albert, Onaga.
Kramer, D. A., Washington.
Lahr, Jas. P., Sabetha.
Landon, W. P., Cunningham.
Lantis Bros., Sedgwick.
Larson, J. A., Everest.
Leeper Bros., Benedict.
Lenert, S. H., Hope.
Lewis, A. D., Lyon.
Lunt, Harry E., Burden.
McAfee, H. W., Topeka.
McAlister, W. B., Holton.
McArthur, Cecil, Walton.
McCroskey, W. A., Logan.
McDonald, W. M., Girard.
McKee, N. D., Cedar Bluffs.
McKittrick, P. H., McCracken.
Maffet, Geo. W., Lawrence.

Maguire, F. P., Hutchinson.
Mains, Jas., Oskaloosa.
Manrose, N., Ottawa.
Marshall Bros., Burden.
Marshall, John D., Walton.
Mead, L. A., Carbondale.
Merriam, Chas. W., Topeka.
Merritt & Wilhide, Great Bend.
Middleton, D. W., Melrose.
Miller, W. A., Council Grove.
Miller, W. H., Ness City.
Mitchell. Dr. Geo. B., Ottawa.
Monroe, Hooper, Frederick.
Montgomery, A. G., Clyde.
Moore, W. A. C., Auburn.
Morrison, Chas., Phillipsburg.
Morrison, S. A., Topeka.
Morse, O. E. & Son, Mound City.
Moyer, L. E., Junction City.
Mull, A. B., Iola.
Myers, J. W., Galva.
Nevius, C. S., Chiles.
Nichols, W. E., Sedgwick.
Northup, H. J., Frankfort.
O'Brien, M., Liberty.
Osburn, M. F., Keats.
Parsons, L. F., Salina.
Peacock, W. R., Sedgwick.
Pitcher, Wm. N., Topeka.
Plougbe, H. A., Meriden.
Plummer, W., Osage City.
Powell, W. S., Moline.
Pray, Ed & N. A., Kiowa.
Preston, R. W., Walnut.
Priest, G. W., Meriden.
Pringle, Andrew, Eskridge.
Reid, W. L., North Topeka.
Reynolds, J. W., Ottawa.
Rhodes Bros., Wellsville.
Rohrer, S. B., Topeka.
Ross, Geo. B., Lyons.
Schmidtz, A. & P., Alma.
Schrepel, F. H., Ellinwood.
Scott, G. B., Carbondale.
Seaton, John A. & Son, Vernon.
Shaffer, Chas. M., Milan.
Sherman, E. P., Wilder.
Sherman, M. M., Geneseo.
Shideler, Henry, McCune.
Shull, Howard, Mulvane.
Shultz, G. R., Lawrence.
Smith, Geo. E., Cuba.
Smith, O. B., Cuba.
Snodgrass, C. S., Galt.
Snyder Bros., Winfield.
Somers, M. L., Altoona.
Stafford, W. B., Bronson.
Stratton, G. D. & Son, Walton.
Strickler, J. F., Highland Station.
Strong, J. C., Moran.
Sumpter, F. M., Argonia.
Swiercinsky, F. C., Belleville.
Taylor, J. H., Chapman.
Thomas, H. A., Freeport.
Thompson Bros., Marysville.
Tilton, Chas., Lincoln.
Trott, D. M., Abilene.
Van Buskirk, D. F., Blue Mound.
Vansell, M. C., Muscotah.
Van Nice, D. C., Richland.
Van Horn, W. B., Lone Star.
Walbridge, L. C., Russell.
Wales, Wm., Osborne.
Walker, J. S., Groveland.
Wampler, J. W. & Son, Brazilton.
Ware, P. L. & Son, Paola.
Watkins, J. A., Whiting.
Webster, R. C., Utica.
Weidemeyer, H. E., Marysville.
Wheeler, R. H., Lawrence.
White, C. N., Bennington.
Whiting, T. W., Kelso.
Whitzell, Mrs. S. M., Lawrence.
Wilbur, C. A., Topeka.
Wilson, R., Hoyt.
Wiltberger, Frank, Winfield.
Wimmer & Son, Mound Valley.
Winn & Mastin, Mastin.
Ziegra Bros., McCune.
Ziller, John D., Hiawatha.
Zimmerman, Elias, Fairview.

DUROC-JERSEY SWINE.

Alberty, M. H., Cherokee.
Albrecht, Philip, Athol.
Arnold, L. D., Salina.
Bailey Bros. & Co., Beattie.
Bell, Wm. H., Everest.
Blocher, Peter, Richland.
Burns, Wm., Carbondale.
Burton & Burton, Topeka.
Butterfield, J. W., Mulvane.
Chandler, J. F., Frankfort.
Clark, C. H., Colony.
Conner, A. B., Holton.
Coppins, H. A. J., El Dorado.
Crow, W. R., Hutchinson.
Davis, J. B., Fairview.
Davis, Thos. J., Nickerson.
Dawson, Geo. E., Clements.
Dietrich, W. J., Carbondale.
Dorr, A. G., Osage City.
Drumm, E. A., Eskridge.
Eastman, R. J., Lawrence.
Erickson, E. H , Olsburg.
Garrett, W. F., Portis.
Getz, J. W., Freeport.
Gwin, N. A., Lawrence.
Hague, H. H., Walton.
Hatch, Henry, Gridley.
Hemenway, M. C., Hope.
Howe, Jas. U., Wichita.
Howey, V. B., Topeka.
Kerr, Geo., Sabetha.
Leach, J. C., Carbondale.
Loper, G. L., Norcatur.
Lowe, J. L., Erie.
Lukens Bros., North Topeka.
McClelland, F. L., Berryton.
Mangold, J. L., Pontiac.
Marshall Bros., Burden.
Mason, W. E., Berryton.
Mitchell Bros., Buxton.
Montgomery, R. B., Burlingame.
Newcomb, Geo., Morrowville.
Newland, C. G., Baileyville.
Newton Bros., Whiting.
Norton, R. F., Clay Center.
Orr, D. O., Topeka.
Parsons, L. F., Salina.
Perrin, A. D. & H. L., Prescott.
Pratt, C. E., Frankfort.
Priest, G. W., Meriden.
Randle, Wm. R., Hutchinson.
Reid, J. W., Portis.
Reisner, J. W., Atchison.
Riggs, H. C., Wetmore.
Rogers, J. K., Burlingame.
Russell, A. D., Mulvane.
Samuelson Bros., Cleburne.
Sawyer, N. B., Cherryvale.
Schandorf, Henry, Gladie, Okla.
Solt Bros., Barnes.
Staadt, J. F., Pomona.
Steinmeyer, H. W., Volland.
Stodder, J. F., Burden.
Sturdy, E., Bradford.
Sullivan, L. H., Cedarvale.
Taylor, C. W., Pearl.
Thoes, E. W., Alma.
Tredway, J. T., La Harpe.
Trott, D. M., Abilene.
West & Wilson, Silver Lake.
Whiting, T. W., Kelso.
Williams, G. C., Glasco.
Wilson, O. M., Silver Lake.
Wilson, R., Hoyt.
Woffenden, R. C., Sedgwick.
Woodworth, E. R. & Son, Walnut.
Ziegler, T. F. La Harpe.
Zimmerman, Fred, Moray.

BERKSHIRE SWINE.

Achenbach Bros., Washington.
Baird, O. W. & Son, Marquette.
Bayor, J. H. & Son, Yates Center.
Berry, Geo. W., Emporia.
Gardner, E. E., Scranton.
Guthrie, T. F., Saffordville.
Hedderman, H., Topeka.
Hubbard, T. A., Rome.
Hutley, E. J., St. Marys.
Kelley, Geo. M., Lenora.
King, E. D., Burlington.
Kirby, O. W., Paola.
Langley, S. P., Morland.
Landis, J. E., Abilene.
Lucas, J. E., Lyons.
Magers, J. S., Arcadia.
Manwaring Bros., Lawrence.
McCall, John, Sabetha.
Melville, E. W., Eudora.
Page, David G., North Topeka.
Phillips, W. H. S., Carbondale.
Rhodes, Will H., Tampa.
Rummell, G. W., Hutchinson.
Sands, J. P. & Sons, Walton.
Stannard, C. A., Emporia.
Stinson, Frank R., Phillipsburg.
Stratton, E. C., Pavilion.
Sutton, Chas. E., Russell.
Updegraff, O. P., Topeka.
Wampler, J. W. & Son, Brazilton.

CHESTER WHITE SWINE.

Button, Adelbert, North Topeka.
Button, D. L., North Topeka.
Chacey, A. P., North Topeka.
Huggins, C. J., Wamego.
Lieb, H. A., Westphalia.
Miller, Willard A., Peoria.
Neiswender, L. H., Silver Lake.
Nutting, H. D., Emporia.
Owen, A. J , North Topeka.
Staley, A. E. & Son, Ottawa.
Stambach, Thos., Mount Hope.
Stanley, D. W., Hoyt.

YORKSHIRE SWINE.

Boyer, J. I., Kansas City.
Davis, H. M., Thayer.
Whiting, T. W., Kelso.

TAMWORTH SWINE.

Freelove, C. W., Clyde.

SHROPSHIRE SHEEP.

Altemus Bros., Strong City.
Anderson & Findlay, Iola.
Babbitt, J. W., Hiawatha.
Crow, W. R., Hutchinson.
Gallagher & Myers, Highland Sta.
Gilbert, R. L., Lawrence.
Hague, H. H., Walton.
Hamblin, C. G. & Son, Altoona.
Kelley, M. A., Bucyrus.
Kirkpatrick & Son, Wellsville.
Kirkpatrick, H. M., Wolcott.
Myers, E. S., Chanute.
Purviance, R. B , Erie.
Seaton, John A. & Son, Vernon.
Strickler, J. F., Highland Sta.
Templin, Olin, Lawrence.

MERINO SHEEP.

Cook, W. W., Russell.
Grau, J. M., Asherville (Delaine).
Hamblin, C. G. & Son, Altoona.
King, E. D., Burlington.
Walbridge, L. C., Russell.
Westbrook, C. E., Peabody.

RAMBOUILLET SHEEP.

Heymann, John H., De Graff.
King, E. D., Burlington.
Tredway, J. T., La Harpe.

OXFORD DOWN SHEEP.

Baird, W. F., LaCygne.

ANGORA GOATS.

Blocher, Peter, Richland.
Deming Ranch, Oswego.
Gwin, N. A., Lawrence.
Johnston, R. C., Lawrence.
Kelly, M. A., Bucyrus.
Knollin, A. J., Kansas City, Kan.
Lacy, R. B., Meriden.
Langley, S. P., Morland.
Stambach, Thos., Mount Hope.
Stainbrook, Daniel, La Cygne.
Tudor, H. O., Holton.

POULTRY.

Arnold, L. D., Salina.
Babbitt, J. B., Hiawatha.
Baird, Dr. O. W. & Son, Marquette.
Bourgette, J. R., Bodarc.
Buck, R. M., Eskridge.
Clark, S. G., Belpre.
Cook, Porter S., Meriden.
Cool, J. W., Keelville.
Hoagland, J. E., Holton.
Crow, W. R., Hutchinson.
Deming Ranch, Oswego.
Graham, Frank, Westphalia.
Guthrie, H. D., Iowa Point.
Guy, Frank E., Oberlin.
Jordan, A. M., Alma.
Hanna, W. S., Pomona.
Hinshaw, John E., Emporia.
Maffet, Geo. W., Lawrence.
Huggins, C. J., Wamego.
Hughes, J. W. F., Topeka.
Hull's Sons, L. B., Pomona.
Huse, A. F., Manhattan.
Hutley, E. J., St. Marys.
Kelley, Geo. M., Lenora.
Kilmer, M. O., McPherson.
Knowlton, E. J., Alden.
Kolterman, Albert, Onaga.
Larson, J. A., Everest.
Lunt, Harry E., Burden.
McArthur, Cecil, Walton.
McKittrick, P. H., McCracken.
Newland, C. G., Baileyville.
Northup, H. J., Frankfort.
Nutting, H. D., Emporia.
Peckham, C. W., Haven.
Priest, G. W., Meriden.
Rait, A. C., Junction City.
Seal, Jos., Wakefield.
Sutton, Chas. E., Russell.
Van Buskirk, D. F., Blue Mound.

MISCELLANEOUS.

Bailey Bros. & Co., Beattie, Scotch terriers.
Bell, J. W., Topeka, fancy harness horses.
Blair, Wilkie, Girard, fox terriers.
Bourgette, J. B., Bodarc, English fox terriers.
Chacey, A. P., North Topeka, Scotch collies.
Clark, C. H., Colony, Shetland ponies.
Jackson, C. H., Jetmore, cattle.
Lieb, H. A., Westphalia, O. I. C. swine.
Marriage, John, Mullinville, "Marriage" cattle.
Nutting, H. D., Emporia, Scotch collies.
Sutton, Chas. E., Russell, Scotch collies.
Zimmerman, Fred, Moray, fox hounds.

DAIRYING

TWENTY years ago Kansas had but 471,548 milch cows, and scarcely a creamery worthy the name, and their product was unsought.

Ten years ago Kansas had 567,353 milch cows; creameries of a better class were being slowly established, but their output begged a market.

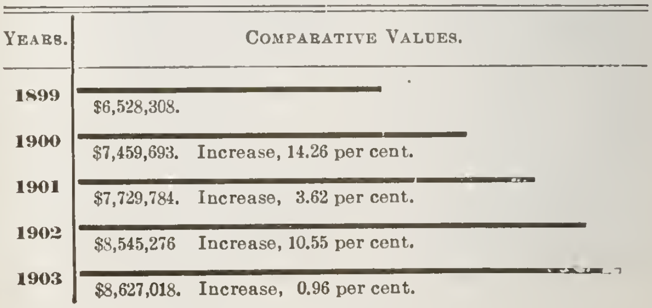
To-day Kansas has 802,738 milch cows, or more than at any previous time, and many high-grade creameries and cheese factories, including the largest creamery in the world, hundreds of contributory receiving and skim stations; and their product is not only favorably known in the principal markets, but sought beyond the supply.

Thus is marked the progress of this industry in Kansas—in a decade become one of the most prominent of successful dairy states, and within that time nearly doubled the aggregate annual value of the dairy products.

Dairying has come to be one of the most important factors in Kansas agriculture, and, rightly conducted, is one of the surest money-makers of our varied industries. It is incomparably more rational than any one-crop system, or even general farming, as its practice tends to rotation of crops, adds to the fertility of land, and affords steady employment, with returns remunerative according to the brains mixed with the business.

Kansas farmers are learning year by year that their business, if profitable, must be so conducted that it is not the mere playing of a game of chance with the weather or a single crop. Those who most fully recognize these conditions and most intelligently respond to their inexorable requirements are realizing a fair or large prosperity. More attention, therefore, is being given to a diversity along agricultural lines, and quite naturally many have taken to cow culture. Kansas is admirably suited to the profitable pursuit of dairying. On her productive soils can be raised unlimited supplies of the best flesh- and milk-producing foods at incomparably low cost; her meadows and pastures furnish nutritious and succulent grasses in abundant and wide variety, and the winters are short and mild, thereby making long-time sheltering and expensive indoor feeding and care less a necessity. The corn, Kafir-corn and other sorghums, alfalfa, clover, and grasses, produced here in great profusion, with the brans from our wheat, are, in a large measure, the ideal cheap raw material, for manufacturing on the farm, by means of the cow, commodities that afford a ready-money income every month.

This diagram shows the values of Kansas dairy products annually, and their increase for five years, ending 1903:



Dairying, largely and methodically conducted, is comparatively a new feature in the agriculture of Kansas. Prior to 1890 the systematic production and marketing of butter and cheese were given at best only desultory attention, and those identified or somewhat familiar with this industry then did not, as a rule, esteem the returns therefrom of sufficient volume or importance to warrant the outlay of any considerable sum of money for improvement and extension along that line.

The institution of skimming stations, creameries, and cheese factories, begun some twelve years since, has from the first pointed out that the use of better cattle was well-nigh imperative to make the business profitable and at the same time secure a product of superior quality. Through persistent endeavor to have dairy herds of high grades, if not pure-bloods, the farmers and dairymen have been continually eliminating the more unprofitable animals, and statistics, for a period of five years ending with 1896, show that the number of milch cows in the state decreased more or less with each of those years while this vigorous campaign of improvement was being waged; but the figures also show that the value of their product, instead of correspondingly decreasing, has actually increased in three of the five years, thus making apparent that improvement in the milch cows has been a most potent factor in advancing the dairy interests of Kansas, and to-day many have excellent, high-yielding herds.

Since the good foundation has been established there have been steady growth and advancement. In 1897 the number of milch cows was 552,538, or an increase of more than 7 per cent. over the previous year; in 1898 a gain of over 9.5 per cent. was made; the increase in 1899 was almost 13 per cent.; in 1900 there were 28,400 more than in the previous year, and the increase in 1901 was more than 11 per cent. In 1902 the number was slightly less than the previous year, while 1903 showed a gain of 10,894, or 1.4 per cent., making a total for the state of 802,738, the largest ever recorded—a gain in numbers since 1896 of about 288,000, or 55 per cent., and their value is $21,673,926, or an increase during the same time of over 65 per cent.

The United States Department of Agriculture places Kansas seventh in rank in number of milch cows, and since once fairly awakened to the importance and possibilities of dairying, there is every reason to believe that her progress will be continuous and permanent. The 1903 aggregate value of butter and cheese made and milk sold for other purposes was $8,627,018, the largest in the history of the state, being $81,742 more than in the preceding year, and $3,367,266, or 64 per cent., more than in 1897. While the unthinking might regard the products of the cow as of minor importance, it is interesting to know that their total 1903 value was six times greater than the output of the rich Kansas zinc- and lead-mines in 1902, and that it probably would have paid the total state, county and township taxes for the year. If the values of the large quantities of butter and milk consumed in the homes on the farms were added, the grand total would be considerably increased, but, unfortunately, there is no official account taken of that.

During the past ten years the manufacture of cheese has increased over 389 per cent., the total output of 1901 being 1,568,433 pounds, valued at $145,609.

The table given below shows the quantity of butter made in Kansas, and its value, in each of the ten years named, compiled from the official records of the State Board of Agriculture:

	POUNDS.	VALUE.
1903	46,222,022	$7,876,227.40
1902	44,350,829	7,517,331.65
1901	43,771,076	6,880,143.44
1900	41,745,759	6,641,692 06
1899	43,082,767	5,775,523 07
1898	41,450,981	5,320,144.86
1897	37,213,928	4,585,271.18
1896	35,007,334	4,225,896.44
1895	31,154,220	4,050,048.60
1894	27,412,211	4,385,953.76
Totals	391,411,127	$57,258,232.46

These figures vividly and forcibly portray the magnitude and steady growth of the butter-making industry in Kansas, showing that since 1894 its manufacture has increased sixty-two per cent., and that its value, along with that of cheese made and milk sold for other purposes, for the years mentioned, aggregates nearly $64,518,382, an irrefutable testimonial to the adaptability of the Sunflower state for the profitable culture of the cow, telling tersely that Kansas, while yet comparatively in her infancy, is a most aggressive competitor for the premier place in the list of successful dairy states.

Scores and scores of creameries, at first established as questionable experiments, are now permanent, profitable institutions, and produce butter and cheese in increasing quantities and of export quality. Admirable natural roads, passable everywhere throughout the year, enable the producer to bring his supplies to the stations or factories regularly. The use of new and improved machinery and the presence of rival companies with large capital insure eager acceptance of the milk, and a profitable cash remuneration each month of the year to the producer, whether marketing the product of one cow or of 1000. The markets of the whole country are available the year through, modern transportation and refrigerating facilities insuring the prompt delivery of goods in perfect condition for the dealer or the table. To such an extent is this true, that within the past two years many car-loads of Kansas butter have found remunerative demand in transatlantic markets.

At the Columbian Exposition, in Chicago, Kansas butter made a most gratifying record in competition with that from the older dairy states most famed for the excellence of their dairy goods. The June score of Kansas butter was 94.54, leading Indiana, New York, and Connecticut. The July score was 91.59, leading Minnesota, Indiana, Pennsylvania, and New York. The score for September was 91.96, a better showing for the month than made by either Illinois, Indiana, or New York. The October exhibit indicated an average score of 93.07, outranking Nebraska, Iowa, Illinois, New York, Vermont, and Canada. Kansas reached the 99 mark on one exhibit in June, and the lowest score was 78, in July; one state scored as low as 60 on butter in July. The average score of all the states combined was 92.9; the general average of the 104 Kansas exhibits was 94.025. At the meeting of the National Butter makers' Union, at Cedar Rapids, Iowa, a few years since, one lot of Kansas butter scored 96.33, and the lowest score on the Kansas exhibit was 90.8. The average score was one point above Wisconsin, a fraction above Illinois, and a little over a point above the Iowa average, and less than a point below Minnesota, that took first prize. Kansas butter at the Iowa meeting came in competition with that from New Hampshire, South Dakota, Indiana, Ohio, Washington, Mississippi, Illinois, Iowa, and Wisconsin, but was excelled by Minnesota only, whose score was 97.82. Kansas creamery butter stands well at the head of the most exacting markets.

The many well-to-do communities in this and other lands where dairying is a leading industry indisputably prove that, wisely conducted, it has yielded a higher prosperity than general farming. It not only gives better and more frequent returns in cash, but it enables the farmer to maintain and even increase the fertility of his land.

It would seem that Kansas offers advantages equal, if not superior, to those of any state or province anywhere for the profitable pursuit of dairying.

A Business Block in the Alfalfa Country — "Out there in Kansas."

CLOVERS AND GRASSES

TWO plants, wonderful for their already proven productiveness and excellence, have come into the agriculture of Kansas within the past twelve years, and are already so established in the esteem of those who know them best as to be regarded not simply as benefactions to the stockgrower, but well-nigh indispensable. These are alfalfa (*Medicago sativa*) and sorghum, the chief variety of which for forage or grain is Kafir-corn, one of the many nonsaccharine sorghums.

The first official notice of alfalfa was taken by the enumerators in 1891, when they returned the total area at 34,384 acres, and each year since has shown a marked extension. In 1892 there was shown an increase in the acreage of 82 per cent.; in 1893 there was more by 15.8 per cent; in 1894 a gain of 20 per cent., and in 1895 it was more than doubled; in 1896 and 1897 the increase was 11 and 10 per cent., respectively; in 1898 it was more than one-third; in 1899 a gain of one fifth over the previous year, reaching a total of 278,477 acres. In 1900 the acreage was not increased, but the following year witnessed a gain of over 15 per cent. The acreage of alfalfa steadily increased each year as it became better known and appreciated, and the area in 1902 was more than that of the preceding year by 139,350 acres, or 43.6 per cent; in 1903 the gain was 108,099 acres, or 23.6 per cent., making the state's total area 566,592 acres.

The diversified weather in 1901 served admirably to emphasize the desirability of growing alfalfa in the Middle West, and also testified forcibly to its adaptability. The wonderful performances that year of this widely exploited plant have attracted attention anew to its worth, it having yielded two, three, four, and sometimes five cuttings, and the stockman possessed of even a small acreage is in an enviable situation.

The intelligent Kansas farmers, whose state far and away leads all others in alfalfa-production, are constantly bettering their conditions and chances for success by devoting larger areas to its culture, as is conspicuously indicated in official statistics compiled by the State Board of Agriculture. For instance, in 1891 the total returned was 34,384 acres. In 1903 its field extends over 566,592 acres, showing a phenomenal increase in the twelve years of over 1547 per cent. Even when first considered of sufficient importance to be officially recognized as belonging to Kansas' repertoire of crops, a canvass of the returns for that year (1891) shows that, with the three exceptions of Atchison, Johnson, and Miami, each county devoted more or less land to its growth, Finney county leading with 5717 acres: while the counties ranging between that number and 1000 acres were Kearny, Chase, Cloud, Gray, Lyon, Saline, Sedgwick, and Wabaunsee; and of those claiming an acreage at all, Linn was among the smallest, having two acres. Now, while not the foremost, Finney has 12,579, and Linn 1520, and the three counties mentioned as having none in 1891 have a total of 3171 acres. The following table of acreages shows the relative standing of the twenty-four present leading alfalfa counties for 1903, with the figures for 1902 and 1891 for comparison:

	COUNTY.	1903.	1902.	1891.
1	Jewell	38,518	33 976	296
2	Butler	25,528	21,651	503
3	Republic	22.457	17,452	496
4	Greenwood	18,586	12,247	421
5	Smith	17 933	14,620	53
6	Norton	19,359	19,351	412
7	Chase	15,164	12,106	1,401
8	Phillips	14,709	13,110	111
9	Lyon	14,647	11,719	1,098
10	Marion	14,391	12,111	851
11	Mitchell	14,175	11,314	880
12	Sedgwick	13,864	11,496	1,023
13	Pottawatomie	13,222	9,867	334
14	Wabaunsee	12,866	11,751	1 031
15	Finney	12,579	11,945	5,717
16	Cloud	12.393	9,618	2,018
17	McPherson	12,079	9,778	980
18	Decatur	12,051	10,264	160
19	Reno	11,012	8,393	654
20	Saline	10,999	9,553	1,099
21	Dickinson	10,979	7,680	703
22	Rice	10,398	7,525	635
23	Osborne	10,223	9,511	379
24	Harvey	10.201	6.004	282
	Totals	368,333	303,042	21,567

This table is strikingly suggestive of the rapidity and extent to which worth alone has brought recognition to a very wonderful field crop. As will be noted, the total acreage of the twenty-four counties in 1891 lacks 16,951 acres of equaling that of the one county of Jewell in 1903, and in fact the acreage of Jewell in 1903 is greater by over 4131 acres than the state's entire alfalfa area in 1891. It is difficult to adequately comprehend the magnitude of the increase, and, however prodigious it may appear so expressed, it is a fact that Smith county gained over 33,736 per cent. in acreage in the twelve years, Phillips over 13,151 per cent., etc., in a lesser degree to the end, those mentioned being given as striking examples.

It is also noteworthy, and will be seen from the foregoing table, that three counties this year each have a larger acreage than the total for the listed twenty-four counties in 1891. The 1903 figures proclaim an increase for the state of 108,099 acres, or twenty-three per cent. over the previous

Putting the Alfalfa in Stacks—"Out there in Kansas."

year. Every county in the state, save four, is represented in the list of counties growing alfalfa, with acreages ranging from 16 acres in Morton to 38,518 in Jewell.

The total area of the twenty-four leading counties in 1903 surpasses the acreage of the *whole state* for any one year prior to 1902, being fifteen per cent. greater than 1901, and thirty-three per cent. greater than 1900. Only five counties show a decrease—a total of 4193 acres—while ninety-six show an increase of 112,292. The largest single-county increase over 1902 was made by Greenwood, which gained 6339 acres; Republic gained 5005 acres; Jewell, 4542; Harvey, 4197; Butler, 3877; Pottawatomie, 3355; Smith, 3313; Dickinson, 3299; and Chase, 3058. In the year 1891 the total acreage for the state was 34,384 acres; the total increase in acreage for the above-mentioned nine counties for 1903 is 36,985 acres, or 2601 acres more than the entire area in 1891.

In 1903 twenty-four counties had 10,000 acres or more, the leading seven of which have 15,000 and over. In 1891 but one county, Finney, had over 5000 acres.

The twenty-four leading alfalfa counties of the state have 368,333 acres, which is sixty-five per cent. of the total area planted.

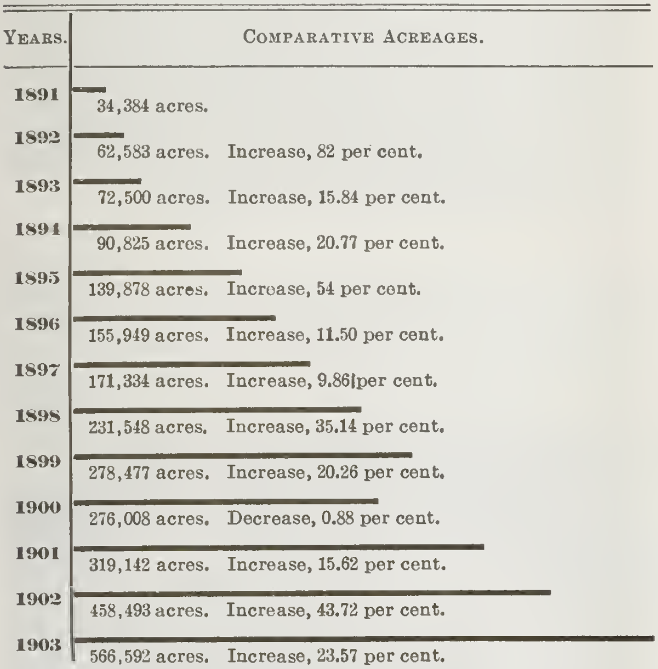
Six adjoining counties of the northern tier, namely, Decatur, Norton, Phillips, Smith, Jewell, and Republic, this year have a combined acreage of 125,027 acres, which is somewhat more than twenty-two per cent. of the state's acreage. In 1891 these same six counties had a combined acreage of 1558 acres.

In all portions of the state is displayed a remarkable and increasing interest in alfalfa-growing, as is demonstrated by the large gain. Some counties presenting notable examples of the continued activity in sowing alfalfa are: Sherman, with an increase over the previous year of 14,100

per cent.; Comanche, 316 per cent.; Scott, 222 per cent.; Seward, 177 per cent.; Ellis, 130 per cent.; Ness, 127 per cent.; Clark, 100 per cent.; Hodgeman, 100 per cent.; Crawford, 100 per cent.; Grant, 100 per cent.; Wyandotte, 100 per cent.; Harper, 81 per cent.; Rush, 80 per cent.; Clay, 70 per cent.; Harvey, 70 per cent.; Geary, 67 per cent.; Pawnee, 67 per cent.; Marshall, 66 per cent.; Barton, 60 per cent.; Labette, 60 per cent.; and Greenwood, 51 per cent.

Alfalfa seems to flourish in well-nigh all sections of the state, and after once gaining a firm root-hold can be safely relied upon to produce from two to five cuttings each year, whether the season be wet or dry.

This diagram shows comparative acreages of alfalfa in Kansas annually for thirteen years, beginning with 1891 (when the crop was first returned by assessors) and ending with 1903.



This perennial, with its long, penetrating roots, reaching to great depths, has thereby unusual powers of resistance to protracted dry weather, and, while the ideal conditions of soil are most commonly found in the valleys of streams, experienced observers are generally agreed that it can be grown profitably on the higher lands, to a greater or less extent, in every county of the state. Scientists and unlearned farmers are alike in crediting alfalfa with nutritive qualities of a very high degree, and unsurpassed excellence for use with other foods in making a suitably balanced ration, either for fattening animals or those maintained for the production of milk.

Among the tame grasses, timothy has been alfalfa's leading competitor in area until 1902, when the returns proclaimed its field as 138,657 acres, or thirty per cent. smaller than that devoted to alfalfa, and in 1903 the difference in favor of the latter is still greater, although the acreage of timothy gained in the twelve months. It is an interesting fact, also, that as early as the fourth year of alfalfa's statistical record (1894) its area exceeded by 24,000 acres that of the other clovers for the same year, and each canvass since has shown a constant widening between their areas.

Timothy and clover, as hay plants, have been long and favorably known in the agriculture of the United States, and occupy a high and well-earned place in the list of such, wherever grown, and alfalfa is their superior. The statistics give indisputable evidence that, under Kansas conditions, alfalfa is proving to be the most valuable of her forage-plants, which in nowise detracts from the well-known merits of others.

Following is a table giving the acreages of alfalfa, clover and timothy in Kansas, beginning with 1891 (the year alfalfa statistics were first gathered) and each year since, ending with 1903:

	ALFALFA.	CLOVER.	TIMOTHY.
1891..........	34,384	158,589	498,854
1892..........	62,583	127,994	576,315
1893..........	72,500	83,346	577,343
1894..........	90,825	66,474	536,134
1895..........	139,878	87,089	464,646
1896..........	155,949	93,007	355,657
1897..........	171,334	138,785	347,904
1898..........	231,548	180,146	330,432
1899..........	278,477	202,607	320,485
1900..........	276,008	219,834	317,039
1901..........	319,142	263,593	333,686
1902..........	458,493	109,172	319,836
1903..........	566,592	120,483	361,533

This portrays with statistical accuracy the steady rise of alfalfa in Kansas from comparative obscurity to the foremost rank of the state's forage-plants, and suggests the present relative esteem in which they are held by Kansans.

Possessing many, if not all, the good qualities of the much-prized Red clover, besides others, some of which are its growing luxuriantly in a wide territory where clover cannot be grown at all, and yielding from two to three times as much of feed equally nutritious, along with being a remarkable soil renovator, it is esteemed as indeed a rich acquisition to a region where it flourishes so abundantly. In spite of the fact that clover is so reliably and profitably grown in the eastern counties, alfalfa, regarded by many as only adapted to a semi-arid region, has by sheer merit forced its way into these counties until one-sixth of the state's entire alfalfa field is now found in the clover-growing counties. In fact, 52 per cent. of the alfalfa acreage at the present time is in the eastern half of the state, although in the western counties the acreage in proportion to population is greater than in the eastern counties, all of which indicates the high appreciation shown the crop in all directions.

Its largest annual yields, of from four to six and more tons per acre, are obtained in the rich bottom lands of the Arkansas valley, where abundant moisture is found not many feet from the surface, and where three, four and sometimes as many as five cuttings are made in a single season; the same applies also to lands favorably situated for irrigation. Those who have raised and used alfalfa longest and most esteem it with increasing favor, and it seems likely to be more and more extensively produced as the years go by. As is well known, alfalfa in itself is nearly a balanced ration, and Kansas farmers and stockmen are coming so to esteem its value as a feed for their live stock that they retain it largely for home use, and for that reason it is often a difficult matter for buyers, either those on the ground or from other states, to find sellers. As a ration for dairy cows it is incomparable, and it is a significant fact that the owner of one of the largest and best equipped dairies in the United States, located in Illinois, recently sent to Kansas to secure some of her alfalfa hay as a feed for his dairy animals. As a soil renovator it has been described in the following language.

"There are some silent subsoilers that do their work with ease and, in their way, as effectually as any team or plow ever hitched, although in some lands the use of a subsoil plow is essential to the best beginning of such work. The clover plant is righteously famed as one of these, and alfalfa is its superior. Its roots work Sunday as well as Saturday, night and day; they strike five, ten, fifteen or twenty feet deep, making innumerable perforations, while storing up nitrogen; and when these roots decay they leave not only a generous supply of fertility for any desired crop, but millions of openings into which the airs and rains of heaven find their way, upon which the husbandman can draw with little fear of protest or overdrafts."

While alfalfa is noted for its deep-rooting propensities, as described above, it is making a still more remarkable record in its upward growth, as suggested by the illustration, one among many somewhat similar, furnished by the 1901 crop of a single grower in Montgomery county, Kansas, who secured five cuttings off one field, which, combined, measured fourteen feet two inches in height, and yielded seven and three-fourths tons per acre, netting $77.50 per acre; and legion are the reports of wonderful profits derived from growing alfalfa in the Sunflower state.

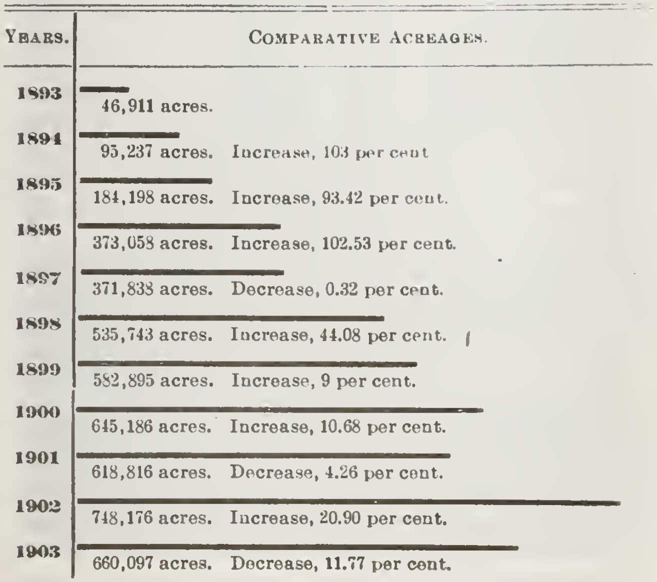
The Year's Fourth Cutting of Alfalfa – "Out there in Kansas"

THE SORGUMS

THE general cultivation and use of the various sorghums as forage-plants, and some of them for grain as well, are becoming more and more a factor in the state's live-stock husbandry; as such they are noticeable on every hand, and in no other part of the United States of similar area are they nearly so extensively grown, favorably known, and highly appreciated. On the limestone lands of the eastern counties, or the higher, sandier plateaus and valleys further west, and on soils of high or low fertility, they yield crops having most acceptable values. Yet they do not bear relegation to fields too foul for other crops, and for the best results should receive as careful attention as would be required for success with Indian corn. The combined acreage of all varieties of the sorghums raised in the state in 1903 was 1,289,781 acres, an area not quite equal to the aggregate of that devoted to all tame grasses, and ranking fourth in this respect among our standard crops.

This acreage is about equally divided between eastern and western Kansas, with fifty-five per cent. of the non-saccharine in the eastern half, and sixty per cent. of the saccharine in the western half.

As forage-plants, the sweet sorghums rank equally with the non-saccharine, such as Kafir-corn, Jerusalem corn, and milo maize, particularly in western Kansas, where higher altitude and a dryer atmosphere are especially favorable for their curing and preservation.



The diagram shows comparative acreages of Kafir-corn in Kansas annually for eleven years, beginning with 1893 (when the crop was first returned by assessors), and ending with 1903.

Far and away the foremost of these non-saccharine sorghums is Kafir-corn, and something of a comparison of its popularity with other sorghums is indicated by figures, beginning with those of 1893, when it was first considered of sufficient importance to be given cognizance by the State Board of Agriculture and its statistics gathered by township assessors. In that year the area planted was 46,911 acres, and of saccharine sorghums 132,205 acres, or 85,294 acres more than Kafir-corn. Their progress as competitors for popularity since then is indicated by the following:

1894	Sorghum, increase, 31 per cent. Kafir corn, increase, 103 per cent.
1895	Sorghum, increase, 63 per cent. Kafir-corn, increase, 93 per cent.
1896	Sorghum, increase, 27 per cent. Kafir-corn, increase, 102 per cent.
1897	Sorghum, decrease, 2 per cent. Kafir-corn, decrease, 0.3 per cent.
1898	Sorghum, increase, 10 per cent. Kafir-corn, increase, 44 per cent.
1899	Sorghum, increase, 16 per cent. Kafir-corn, increase, 9 per cent.
1900	Sorghum, increase, 21 per cent. Kafir-corn, increase, 11 per cent.
1901	Sorghum, decrease, 0.14 per cent. Kafir-corn, decrease, 4.08 per cent.
1902	Sorghum, increase, 0.17 per cent. Kafir-corn, increase, 21 per cent.
1903	Sorghum, increase, 12 per cent. Kafir-corn, increase, 12 per cent.

In 1903 the sorghum area amounted to 605,321 acres, and of Kafir-corn 660,097 acres, showing that in the past ten years the latter had not only overtaken the former, but distanced it by 54,776 acres, or 9 per cent. During the same period sorghum gained 358 per cent., or 473,116 acres, and the increase in Kafir-corn was 1307 per cent., or 613,186 acres.

While the figures disclose the large difference between the annual plantings of these two varieties of sorghums, they by no means depreciate the value of the saccharine or disturb it in the ranks of the best known forage-plants in the world, but are intended to show the marvelous strides being made by a recent competitor claiming not only a foliage of first-class forage quality, but a fattening value in its grain almost, if not quite, equal to Indian corn; virtues which practical farmers and scientists affirm, while declaring it successfully and profitably grown on land high or low, rich or poor, and whether the season be wet or dry.

Farmers who have become acquainted with Kafir-corn are planting a larger per cent. of their poorer land to it yearly and confining their Indian corn to the best parts of their farms, where even then the Kafir-corn in some seasons far exceeds the corn in quantity of both grain and fodder. With the two varieties of sorghum on equal footing in their utilization as forage and grain on the farm, the average value of the yield per acre for the past eleven years (1893–1903), according to the growers of sorghum, was $5.62, and of Kafir-corn $10, showing the value of Kafir-corn to be for their purposes $4.38 per acre, or seventy-eight per cent., greater than sorghum, Further investigation shows for the same period an average grain value for Indian corn of $5.67 per acre after it is husked. The values are given for the sorghum with stover and grain included.

In assuming the difference between the sorghum and Kafir-corn to be the grain value of the latter exclusive of stover, the grain value of Kafir-corn is placed at $4.38 per acre, or within $1.29 per acre of the value of husked Indian corn.

This statement, coupled with the preceding, forcibly suggests for Kafir-corn an early departure in rank from among the exclusively forage-plants to a standing among the highest grade of flesh- and fat- and milk-producing foods. In nearly all the counties showing the heaviest values of cattle, the larger areas of Kafir-corn strongly supplemented by alfalfa prevail, and the same as to values of animals slaughtered or sold for slaughter and output of the dairy products.

Like alfalfa, after securing a strong hold in the eastern counties, Kafir-corn is steadily advancing westward, and is fortunate in discovery of conditions generally conducive to its culture and usefulness.

By the fact that Kafir-corn can be successfully grown in all localities, and of its being a strong resistant to protracted heat and dryness, proved feeding qualities, close or practically equal to corn, having an abundance of the carbohydrates or fat-producing elements, it promises to become as much a principal resource in central and western Kansas as Indian corn is in the east, and when balanced with the deep-rooted alfalfa, richer in protein or frame- and flesh-building materials than almost any other available adjunct, it opens vast possibilities to those who would grasp opportunity.

Sugar Beets.

THE claim that at least some portions of Kansas are well adapted to the profitable growing of sugar beets for sugar making seems to be substantiated in their past three years' experience by those who, in the three western Arkansas river valley counties of Finney, Kearny, and Hamilton, undertook their raising. Theoretically and by popular supposition Kansas has been placed just beyond the boundaries of the so-called sugar-beet belt, but actual practice demonstrates that beets of excellent quality can be raised within her borders. If circumstances and conditions properly adjust themselves so as to make possible a larger tonnage, the area devoted to the culture of sugar-beets will doubtless be expanded and increased beyond the expectation of the most sanguine, and the industry become no inconsiderable factor in Kansas agriculture.

Kansas never tried to raise beets for sugar-making prior to 1901, when, owing to the proximity of a factory at Rocky Ford, Colo., 100 or more farmers, all strange to the business, in Finney, Kearny, and Hamilton, three western Kansas counties, representing a strip of the Arkansas valley seventy-five miles long, undertook the raising of a few acres each, under a contract with the factory, at $4 per ton for all beets with at least twelve per cent. sugar, and an increased price in proportion as the beets were sweeter. Some neglected their crops and did not attempt to deliver them to the factory, but seventy-seven growers harvested 1747 tons from 337 acres, or 22½ tons each, ranging in sugar content, according to the factory's weighing and paying, from 13.3 to 22.8 per cent., and averaging, the good with the bad, 17.8 per cent., while the average in Germany, the great sugar-beet country of the world, is reported as about 15 per cent., and in all Europe but 13½ to 14 per cent. Some of these beets were so rich that the factory was glad to pay as high as $7.50 per ton for them, and paid an average for all Kansas beets of $5.14 per ton, a result both gratifying and significant, especially when the grower's inexperience and insufficient and unsuitable equipment are taken into consideration with the records for quantity and quality.

The average profit per acre realized by thirty-seven growers from whom accurate figures were obtained was $17.08, and ranged, in some instances, as high as $43 per acre. Fifteen of the more successful or painstaking growers raised an average of not quite eleven tons per acre (the maximum per acre was 18.41 tons), yielding an average of 17.59 per cent. of sugar, and $28.48 profit per acre. All this was exclusive of $1 per ton bounty paid by the state.

In 1902 seventy-five growers from 439 acres harvested 4250 tons, or an average of 9.68 tons per acre — an increase in the average yield per acre in one year of 90 per cent., and the season of 1902 will serve as an average one in the part of the state where beets have been grown for sugar-making purposes.

In 1903 the area planted to beets was nearly twice that of the year previous, but the crop was much diminished, owing to the unprecedented late freeze, April 30, when the temperature dropped eight degrees below freezing, killing the young plants in their first leaves. This setback of course disappointed the growers, but did not discourage them, a statement the operations for 1904 will probably verify.

The special representative of the Kansas Board of Agriculture for obtaining proofs of sugar-beet bounty claims in Kansas during the past two seasons has resided in the Arkansas valley for many years, is keenly observant, well acquainted with the conditions there, and in good position to be thoroughly posted regarding the situation, says:

"Experience has taught the growers that sugar-beets are profitable under average climatic conditions, not alone when grown for the manufacture of sugar, but that they also possess a high value as a stock food.

"The September frost in 1903 put an abrupt ending to the melon business of the upper Arkansas valley, but the sugar-beet came through smiling and sweeter than before; in fact, the fall of the year, after the first frosts, is the period when the sugar-beet, luxuriating in the mellow sunshine and cool nights, gathers its largest measure of polarizable sweetness. During the spring it gathers strength, sending its tap-root down deep into the soil, in the summer it gathers bulk, and in September and October it sweetens as it ripens. The more experience we have with the seasons and the climatic conditions prevailing here, the more assurance we have that, when the sugar-beet comes to its own it will become the chief end of agricultural pursuits in this valley, and possess these rich irrigable lands."

County Court-house in the Alfalfa Country—"Out there in Kansas."

The Truth About Kansas.

As shown by Uncle Sam, and Analyzed by the State Board of Agriculture.

A Good Cereal Story.

Following are some figures taken from the official reports of the United States Department of Agriculture presenting in a concise manner, unbiased, unprejudiced and impartial information concerning Kansas and her standing as a foremost producer of the world's greatest cereals.

Value of Wheat and Corn.

Here is a table compiled from the Year-books of the United States Department of Agriculture, giving by states, according to their rank, the total combined value of wheat and corn raised in each of the leading fifteen states, in the five-year period beginning with 1896 and ending with 1900:

STATE.	Rank.	Value of wheat and corn
KANSAS	**1**	**$378,433,347**
Illinois	2	361,630,618
Iowa	3	330,791,771
Nebraska	4	301,419,923
Missouri.	5	275,961,983
Indiana	6	258,562,008
Ohio	7	252,763,713
Minnesota	8	226,883,967
Texas	9	182,489,833
Pennsylvania	10	168,518,387
Tennessee	11	155,085,808
Kentucky	12	153,204,900
Michigan	13	123,979,189
South Dakota	14	117,789,270
California	15	115,315,266

The Straw Not Counted.

Below is Uncle Sam's valuation of the wheat crop of the year 1900 in each of the leading fifteen states, placed in proper rank:

STATE.	Rank.	Value of year's wheat.
KANSAS	**1**	**$45,368,760**
Minnesota	2	32,450,829
California	3	16,555,302
Texas	4	14,973,384
Pennsylvania	5	14,602,560
Nebraska	6	13,145,007
Iowa	7	12,860,952
Washington	8	12,799,297
Missouri	9	11,873,429
South Dakota	10	11,686,817
Illinois	11	11,508,524
Maryland	12	10,783,372
Oklahoma	13	9,888,408
Tennessee	14	9,239,910
Oregon	15	8,908,907

Kansas' Pretty Rank.

List of states according to their rank in value of wheat, wheat and corn, and corn alone, produced by the leading fifteen in the year 1900.

Thus saith the year-book:

Rank.	Wheat state.	Wheat and corn state.	Corn state.
1	**KANSAS.**	**KANSAS.**	Illinois.
2	Minnesota.	Illinois.	Iowa.
3	California.	Iowa.	Nebraska.
4	Texas.	Nebraska.	Missouri.
5	Pennsylvania.	Missouri.	**KANSAS.**
6	Nebraska.	Indiana.	Indiana.
7	Iowa.	Texas.	Texas.
8	Washington.	Ohio.	Ohio.
9	Missouri.	Minnesota.	Tennessee.
10	South Dakota.	Tennessee.	Kentucky.
11	Illinois.	Kentucky.	Georgia.
12	Maryland.	Pennsylvania.	Arkansas.
13	Oklahoma.	Wisconsin.	Alabama.
14	Tennessee.	Georgia.	No. Carolina.
15	Oregon.	No. Carolina.	Wisconsin.

Others Raise Corn, Too.

This is what the Government's Agricultural "Blue" Book suggests about the rank in value of corn produced by the leading fifteen corn states in the year 1900, and says was its value for each:

STATE.	Rank.	Value.
Illinois	1	$84,536,392
Iowa	2	82,582,186
Nebraska	3	65,233,320
Missouri	4	57,827,329
KANSAS	**5**	**52,438,602**
Indiana	6	48,024,256
Texas	7	38,522,568
Ohio	8	36,342,664
Tennessee	9	27,928,961
Kentucky	10	27,706,890
Georgia	11	19,448,132
Arkansas	12	19,447,157
Alabama	13	17,026,446
North Carolina	14	16,980,403
Wisconsin	15	16,350,589

Kansas Still "Ranks."

This table shows, as given out by the national authorities, the rank in value of wheat raised in each of the leading fifteen states; also, their rank in combined value of wheat and corn, and rank in value of corn, for the year 1900:

STATE.	Rank in value of wheat.	Rank in value of wheat and corn.	Rank in value of corn.
KANSAS	**1**	**1**	**5**
Minnesota	2	9	23
California	3	21	35
Texas	4	7	7
Pennsylvania	5	12	16
Nebraska	6	4	3
Iowa	7	3	2
Washington	8	27	43
Missouri	9	5	4
South Dakota	10	17	22
Illinois	11	2	1
Maryland	12	22	26
Oklahoma	13	24	28
Tennessee	14	10	9
Oregon	15	30	39

Kansas Could Buy 'Em.

The following table is what Uncle Sam's Department of Agriculture Year-book shows as to the value of corn and wheat raised in each of the foremost fifteen states in the year 1900, named in the order of their rank:

STATE.	Rank.	Value of corn and wheat.
KANSAS	**1**	**$97,807,362**
Illinois	2	96,044,916
Iowa	3	95,443,138
Nebraska	4	78,378,327
Missouri	5	69,700,758
Indiana	6	53,512,447
Texas	7	53,495,952
Ohio	8	42,394,616
Minnesota	9	41,671,294
Tennessee	10	37,168,871
Kentucky	11	36,292,454
Pennsylvania	12	29,321,115
Wisconsin	13	24,777,212
Georgia	14	24,208,708
North Carolina	15	21.868,261

Figured "Per Capiter."

The table below shows, according to rank, the value of wheat and corn raised in each of the leading fifteen states for each inhabitant, in 1900, based on the United States census for that year and the Agricultural Department Year-book, and also gives the age of each state:

Rank.	STATE.	Age.	Val. of wheat and corn per capita, 1900.
1	Nebraska	34	$73.50
2	**KANSAS**	**40**	**66.51**
3	Iowa	55	42.76
4	Minnesota	43	23.79
5	Missouri	80	22.43
6	Indiana	85	21.26
7	Illinois	83	19.92
8	Tennessee	105	18.39
9	Texas	56	17.54
10	Kentucky	109	16.90
11	Wisconsin	53	11.97
12	North Carolina	112	11.54
13	Georgia	113	10.92
14	Ohio	99	10.15
15	Pennsylvania	114	4.65

These figures should do much to correct any impressions existing that Kansas is not a premier agricultural domain, as they admirably serve to place the Sunflower state in her true light, showing that she has vanquished all competitors, almost unbeknown even to herself, and without apparent effort. Although the magnitude of the state's agricultural importance has long been suspected by the well informed, the actual revelation of Kansas' real greatness in this respect through official figures has only of late been given conspicuous publicity.

The statistics quoted proclaim that Kansas is without a peer in her line of undertaking; they inform us, among other things, that of the fifteen states leading in the value of wheat and corn crops in 1900, Kansas, at forty years of age, produced these staples to the extent of $66.51 worth per capita, exceeding the output of Iowa, age fifty-five, by nearly $24 to each inhabitant; surpassing Minnesota, the much-touted wheat state, by nearly $43; Missouri, age eighty, by over $44; Indiana, age eighty-five, over $45; Illinois, age eighty-three, by over $46.50; and so on, with corresponding increasing differences in favor of Kansas to the end of the list.

It is also shown that Kansas leads its nearest rival, Illinois, in the value of wheat and corn produced in 1900, by over $1,750,000, Iowa, Nebraska and Missouri following in the order named. The combined aggregate value of these crops in four of the states of the fifteen but little exceeds that of Kansas alone, which amount is greater than the value of the same crops of Indiana and Ohio together, or more than the united values of Texas and Minnesota.

Kansas, fortunately, is somewhat dissimilar from some of the states with which comparison is made, in that she is not so distinctly a one-crop state, and besides her usually fair rank as a corn-grower, she has been setting a mark as a wheat-producer so far beyond that of her most successful emulator as to have created another class, in which she is alone, as well as annually producing all field crops in abundance.

It probably will be noted that in the foregoing tables, save one, the figures used are for the year 1900. Some of the incredulous, or belittlers, if there be such, may point to that as a significant fact, and erroneously infer that the showing is for a specially chosen year when every circumstance was favoring for such presentation. In order, however, further to strengthen the state's position, and for the benefit of doubters, it will be abundantly sufficient to refer to the first table, where Uncle Sam's highest authority boldly declares that—

For the five years ending with 1900, Kansas produced Corn and Wheat worth Seventeen Million Dollars MORE than any other state in the Union.

These and similar facts, while of common knowledge at home, are not so widely known elsewhere, and the true situation warrants much greater publicity than has been heretofore given them. The definite knowledge that Kansas leads causes neither great surprise nor comment among those who are and have been best acquainted with her history, and the actual fact is calmly accepted by such as a matter of course. The only remarkable feature is the ease and effectiveness with which Kansas surpasses the supposed leaders; in fact, unconsciously, as it were, indicating that there is no appreciable difference in her present standing from that formerly existing, other than the more clearly demonstrated and better understood proofs of uninterrupted development and genuine prosperity.

> " . . . KANSAS . . . *occupies the middle spot of North America, . . . the precise territorial center of the whole vast continent. To such advantages of situation, on the very highway between two oceans, are added a soil of unsurpassed richness, and a fascinating undulating beauty of surface, with a health-giving climate, calculated to nurture a powerful and generous people, worthy to be the central pivot of American institutions.*" CHARLES SUMNER, in the U. S. Senate, May 20, 1856.

"WHOSOEVER WILL MAY COME."

A Kansas Stock Farm.

HORTICULTURE

BY

W. F. SCHELL WICHITA.

NATURE kindly formed Kansas into a southerly slope, the eastern border of which is 750 feet above sea-level, rising gradually as it does to over 4000 feet above the same standard. Down this slope run the Kansas and Arkansas river systems, forming numerous undulations, hills and valleys upon its surface. On these undulating southerly slopes in Kansas there are to be found conditions favorable to almost every horticultural product commonly grown in the United States.

The early horticulturist in Kansas was necessarily an experimenter. He planted every variety, until he, with his later comrades, has found what kinds of fruit can be most successfully propagated and fruited.

Centrally located as Kansas is, it has been found that nursery stock propagated here succeeds well, not only in this vicinity, but in states both north, east, south, and west. Accordingly we find over 3000 acres devoted to the propagation of nursery stock. If there is one thing in this line which Kansas seems to excel in above any other it is in the raising of apple seedlings. For several years past Kansas has practically furnished the apple-seedling output for the trade.

In the matter of fruits, the apple naturally leads. There are now nearly 8,000,000 apple trees bearing, and 4,000,000 trees which have not yet attained the age for bearing. Of the varieties that have long been tried, it has been found that the Ben Davis is the leading market variety, the Missouri Pippin, the Winesap and the Jonathan being closely associated, in the order named. Rawle's Janet, York Imperial, Huntsman's Favorite, Maiden's Blush and Grimes's Golden are grown successfully.

Next in importance comes the peach, with about 3,500,000 bearing trees and over 2,000,000 growing, but yet too young to produce fruit. The favorite varieties are: Triumph, Greensboro, Mountain Rose, Family Favorite, Champion, Elberta, Old Mixon Free, Smock, Salway, Heath Cling, and Wonderful. Several new varieties have been tried, and are gaining in favor each year. In that class are the Fitzgerald, Captain Ede, Carmen, Matthew's Beauty, and Emma.

As in the apples, a notable characteristic is the clear, high color of the fruits produced. This is attended by correspondingly satisfactory qualities in the fruit itself.

Next in number of trees is the plum, there being about 750,000 in bearing and about 250,000 young trees in the orchard. Of the pear trees there are about 250,000 in bearing and about half that number in the young orchards. Of cherries, we have fruiting over 1,000,000 trees, and about one-third of this number in orchard plantations too young to fruit. These figures give the relative importance of the principal tree fruits. A number of other kinds, such as the apricot and the nectarine, grow well here, but are not cultivated so extensively,

One of the most constant and reliable crops is the grape, yielding constant annual returns. There are at present nearly 6000 acres in grape vineyards. Berries are also a successful and profitable crop for market. Their acreage is as follows: Raspberries, about 2000; blackberries, nearly 5000; and strawberries, 3000.

Of no small importance is the market-gardening industry, which is profitably carried on around Kansas City, Atchison, Leavenworth, Lawrence, Topeka, Fort Scott, Wichita, as well as many other towns.

Kansas presents many characteristics which are destined to make her more and more prominent in horticulture as she advances in years. The uplands are rolling prairies,

Horticultural Society Fruit Exhibit.

with a deep alluvial soil, enough clay and sand mingled to make an ideal soil for fruit-growing. The subsoil is red clay, containing sand. Underlying this is limestone, extending from a few feet to forty feet below the surface. This rock stratum is frequently interrupted by seams or cracks, allowing the water to pass off without any drainage. This is the general character of the soil. The bottom lands along the two river systems are characteristically wide, extending on each side of the river from one to five miles. These river bottoms are composed largely of sand intermingled with humus, a mixture which results in a highly productive soil. As is to be expected, here we find some of the finest orchards.

The climate of Kansas has much to do with the favorable results obtained by the horticulturist. The rainfall of the eastern portion is on an average with that of the Mississippi valley; annual average during the past thirty-six years being 36.20 inches. Toward the western portion of the state the rainfall is less, but other conditions enter in to render many localities profitable fruit-growing regions. In addition to its productive soil and the favorable undulations of the land, Kansas has one feature which favors the horticulturist most of all, and that is her brief and mild winters. Now, during this winter of 1902–'03, while this brief account is being written, the middle of January has passed, and the ground is being plowed wherever the farmer so desires; and this may not be considered an exception. The mean average temperature for the thirty-six years past has been 53.23 degrees F. During the same period of thirty-six years the maximum temperature—that is, the hottest average temperature—was 99.7 degrees F., and the minimum temperature during this long period of observation was 10.8 degrees below zero. During this same period of observation the thermometer exceeded ninety degrees only on an annual average of thirty-six days; and still more remarkable, the carefully kept records show that the average number of days, covering a period of from 1868 to 1903, the thermometer went below zero was only four days. Can any thought be more pleasing to the horticulturist than the realization of living in a state where on days of less number than one week in the year the thermometer falls to zero? These temperatures certainly favor the fruit-grower in sunny Kansas. Another matter of considerable interest is that during this same period there have been an average of 202 days between the last spring frost and the first severe fall frost.

The merits of the Kansas river system as a fruit-producing region have been known for some time. The Arkansas river valley is still a new region, and the results thus far in fruit-culture along the Arkansas river have been such as to warrant the prediction that this valley bids fair to become one of the noted fruit-producing regions of the United States. As illustrating this, it is but a few years ago since the culture of canteloups was started in this region, and now this region has the reputation of producing the finest quality of fruit and the most productive yields. The natural conditions are such as to be entirely favorable. Situated in the southern portion of the state, it enjoys even longer summer periods and shorter winter periods than those given in the records. While the rainfall is at times great, the fruit-grower is not entirely dependent upon this for moisture. The underlying strata of this valley being largely composed of sand, the waters of the river permeate the whole substrata underlying these bottom lands. Planted in this sandy loam above, trees easily send their roots down and secure constant moisture. All these have combined to make this portion of the state a constant fruit-producing region, and the results have borne out this fact ever since the fruits of this region have come into bearing. In the western portion of the state, notably at Garden City and Syracuse, remarkably fine fruits have been produced at distances somewhat remote from the river by means of irrigation. The fruits produced from this region are now on exhibition in the Kansas department of the Horticultural Exhibit at the World's Fair, at St. Louis. The size and general merits of these fruits are such as amply to repay a careful examination of these exhibits.

The Kansas horticulturist is further favored by his location. He finds an early market right at hand in Iowa, Colorado, and Nebraska; a later market in Topeka, Kansas City, Wichita and other Kansas towns; while Oklahoma and Indian Territory draw largely upon Kansas for their supply of fruits. All of these conditions, taken together, have resulted in making horticulture a profession in this state. The state supports a flourishing horticultural society, and many counties have county organizations where, in each case, the members meet monthly to discuss various phases of the subjects of fruit-raising and fruit-marketing. It is not infrequently the case in this state that snug fortunes have been accumulated through fruit-raising. There are in this state orchards ranging from 800 to 1200 acres belonging to one man. In fact, in one case, one man owns so many of these large orchards that he has come to be called the "Apple King." This appellation has been given to the Hon. Fred Wellhouse, and a general account of his orchard planting will serve to illustrate the possibilities of apple orchards in Kansas, not only for those larger apple-growers who are devoting their capital exclusively to the production of apples, but also for those farmers who conduct a small commercial orchard in addition to their regular agricultural interests.

In 1876 Hon. Fred. Wellhouse planted, at Glenwood, Leavenworth county, Kansas, 117 acres of apple trees, as follows: 60 acres of Ben Davis, 32 acres of Missouri Pippin, and 25 of Winesap. This orchard yielded, in 1880, 1594 bushels of apples, which sold for $1.50 per barrel, or $797; and in 1881 it yielded 3887 bushels, which sold for $4 per barrel, or $5184.

In 1878 he planted, near Gardner, Miami county, 160 acres, as follows: 80 acres of Ben Davis, 40 of Missouri Pippin, 30 of Winesap, 8 of Cooper's Early, and 8 of Maiden's Blush. These two orchards, of 277 acres, combined, yielded, in 1882, 12,037 bushels, which sold for $2.48 per barrel, or $9950.

In 1879 he planted, at Fairmount, Leavenworth county, 160 acres, as follows: 80 acres of Ben Davis, 40 of Jonathan, 30 of Winesap, 8 of Cooper's Early, and 8 of Maiden's Blush.

These three orchards, of 437 acres, combined, yielded as follows:

	BUSHELS.	SOLD AT—		BUSHELS.	SOLD AT—
1883,	12,388	$3.00 per bbl.	1891,	63,698	$1.75 per bbl.
1884,	11,726	2.04 "	1892,	978	
1885,	15,373	2.00 "	1893,	900	
1886,	34,909	1.45 "	1894,	47,374	$2.50 per bbl.
1887,	33,780	2.11 "	1895,	59,138	
1888,	20,054	1.81 "	1896,	784	
1889,	11,952	2.49 "	1897,	3,758	
1890,	79,170	3.00 "	1898,	3,639	

Kansas Apples and Grapes.

In 1889 he planted, near Wakarusa, Osage county, 800 acres, as follows: 300 acres of Ben Davis, 200 of Missouri Pippin, 160 of Jonathan, 75 of York Imperial, and 65 of Gano. In 1895 this orchard yielded 3470 bushels.

In 1894 he planted, near Tonganoxie, Leavenworth county, 300 acres, as follows: 100 of Ben Davis, 100 of Gano, 33 of Jonathan, 33 of York Imperial, and 34 of Missouri Pippin.

In 1895 he sold nearly 21,780 bushels, put in cold storage 9000 bushels, and sent to dryer 26,600 bushels, making a total for 1895 of 57,380 bushels

In 1896 he set out, near Summit, Leavenworth county, 140 acres, making a total acreage of 620 acres of Ben Davis, 76 of Winesap, 409 of Missouri Pippin, 190 of Jonathan, 150 of York Imperial, 160 of Gano, 16 of Maiden's Blush, and 16 of Cooper's Early.

During this time he sold thousands of bushels of "culls" that are not counted in this statement, excepting in 1895. These culls sold, per bushel, as follows: 1883, at 30 cents; 1884, at 15 cents; 1885, at 20 cents; 1886, at 13 cents; 1887, at 27 cents; 1888, at 14 cents; 1889, at 18 cents; 1890, at 20 cents; 1891, at 15 cents; 1894, at 20 cents.

For profit, Mr. Wellhouse puts the Jonathan first, Ben Davis second, Missouri Pippin third, and Winesap fourth.

The interested reader will also be glad to know how apples are marketed in Kansas. At the close of the season of 1893, Mr. E. G. Hoover, manager of the Hoover orchard, Wichita, Kan., writes:

"We have low, sandy land, with clay subsoil, and have the advantage of an underflow that is prevalent all along the Arkansas valley. This underflow is from five to seven feet below the surface.

"In planting a commercial orchard in this locality, I would advise the planting of Maiden's Blush, Cooper's Early

Gathering Apples in Sedgwick County.

White, for early markets; Grimes's Golden and Jonathan, for the fall and winter trade; Winesap, Stayman Winesap, Ben Davis, Black Ben Davis or Gano, and Missouri Pippin, for winter and spring markets. These ten varieties are enough for any commercial orchard in southern Kansas. They are always salable, and mark as among the top-notchers on any market.

"I pay from one dollar to two dollars a day and board, and carry from thirty-two to forty men. In the picking crew, when running full force, I use ten packers and a foreman on each side of wagon, two facers, one face gatherer, and three sorters, a header, and a man who coopers and stencils the barrels. We grade fancy and choice No. 1, using XXXX brand to designate fancy and XXX to designate choice. These brands we commenced stenciling on the faced head of the barrel four years ago, and have been adopted by most of the growers here as well as the produce houses.

"We store with the Wichita Ice and Cold Storage Company, and have things about as convenient as C. W. Southward, manager, can make them for us. All together, including the bulk, we have about 5000 barrels of apples here in storage."

Turning to the peach, Prof. L. H. Bailey, than whom there is no higher authority, in his Cyclopedia of American Horticulture, introduces the subject of the peach, saying: "The peach is essentially a luxury. Its cultivation is attended with much risk. The areas in which it can be grown with success are scattered, particularly in the Northern states. The peach is tender to frost, and the liability of the buds and blossoms to injury constitutes the greatest risk in the growing of the fruit. Strangely enough, these risks of frost are greater in the South than in the North, because the buds are likely to be swollen by the 'warm spells' of the Southern winter, and to be killed by sudden freezes. In the Northwestern states the peach areas are determined chiefly by mildness of winter temperature. While peaches are grown over a very large range of country in the United States, still the great commercial regions are relatively few." He continues by citing these relatively few regions in which the peach is grown on a large commercial scale. Of Kansas he says: "Another large peach-growing area lies in southern Illinois, extending westward across Missouri, and into Kansas." He concludes these citations thus: "There are isolated places all over the United States in which peach-growing is possible, but the above outline designates the areas of largest commercial importance at the present time."

Mr. P. Voorhees, of Douglas county, has 3000 peach trees. He grows many varieties, so that he is able to have peaches for market from July 4 until October 10. He finds his best markets with the commission firms of Lawrence and Topeka. Mr. William Cutter, of Junction City, likewise has 3000 peach trees, and receives from the home wholesale grocery men and commission men from one to two dollars per bushel. Maj. Frank Holsinger, of Wyandotte county, has had thirty years' horticultural experience in Kansas. The result of this experience is that he has 6000 bearing peach trees. He is but one of the many large peach-growers around Kansas City, where a ready and remunerative market is always to be found for this fruit. The Arkansas valley has many extensive peach-growers. In Barton county, Mr. B. McCullough has over 2000 trees in fruiting. On the western border of the state, in Hamilton county, some of the finest peaches, especially in regard to size and color, are grown. Mr. Cutter adds: "The success of peaches for eight or ten years has greatly increased the demand for trees, and interest in them is far in advance of all other fruits."

Next in number of growing trees are the plum trees. We present the opinion of Mr. A. H. Griesa, of Lawrence, an authority, who has previously written in a horticultural report as follows: "The plum, for the whole Mississippi valley, is one of the minor fruits of commerce; but comparatively few kinds are successfully grown there, while in most of Europe it is of large importance; besides for home consumption, it is largely grown for export and drying. The varieties are the *domestica* or European type. Most all the kinds there grown are the same as have been for many years. In the eastern and northern parts of the United States it is grown to a considerable extent. But the greatest success lies to the west of us. West of a line drawn north and south near Hutchinson, Kan., you may begin planting any of the *domestica* class with reasonable hope of success; as you proceed to the higher and dry regions of the valley success is sure every year. I have never seen better plums grow in any place than in Garden City, Kan. They are comparatively near the markets and have the climate to dry them, the same as in Arizona and California. This may lead some one to ask, Why can they be grown there and not east? The trees grow in both sections, blossom, and set fruit, but in the east it rots, caused by a fungous disease that seems to develop best in the hot and moist climate of the Mississippi valley, and does not develop at all in the higher and dryer regions of the western half of this state and the country beyond, nor in the high lands of Texas, where plums are now largely grown."

The possibilities of pear-growing are only coming to be understood. Said a prominent apple-grower recently: "If my apple orchard were to be set out again, I should have used pear trees instead." The point is, that in pear culture the prices and comparative yields are so highly favorable to the pear.

As to cherries, all sour cherries do exceptionally well, especially the Morellos. The trees are hardy and pass safely through the short winters. The demand always exceeds the supply. They are generally sold in quart berry boxes.

Of grapes, a former member of the United States Division

A Kansas Apple Orchard. Gathering the Fruit.

of Pomology says: "The position of Kansas among the grape-growing states is by no means to her discredit. There is a good market for the product of her vineyards in the great cities of the West and North and in the mining region of the Rocky Mountains. I have seen Kansas grapes in the mining towns of Colorado selling at exactly the same price as those from California. I was told by the merchants there that the delicate, juicy Concord and Delaware were usually preferred to the large, meaty Tokay and Muscat. Every farmer and fruit-grower in Kansas may have plenty of grapes to eat if he will plant and care for the vines. In the western part of the state it is well to lay them down and cover with earth in autumn."

Kansas not only produces large quantities of small fruits, such as strawberries, raspberries, blackberries, gooseberries, and currants, but within her borders are several experimental grounds under private management which are devoted to the perfection of such fruits and the production of new varieties. Probably two of the best raspberries now growing in the West were originated in Kansas. This refers to the Kansas and Cardinal raspberries. The Kansas is a black-cap, and for hardiness, fruiting and ability to resist diseases it ranks among the very best. It is a great bearer, and is probably more generally planted than any other berry. The Cardinal is a red berry, and for size and flavor it ranks among the first. The vine is strong, vigorous, and hardy. The importance of the small-fruit industry may be best illustrated by the fact that there are ten wholesale and retail nurseries in the state devoted almost exclusively to the production of small-fruit plants.

A resident of Chicago once said to the writer, "How do you like living in a country as flat as a table?" This question is given to illustrate the erroneous idea sometimes prevalent concerning the lay of the land in Kansas. The time was when the forest growth of the rolling prairies was held in check by the frequent prairie-fires. But that day has long since passed, and the Year-book of the United States Department of Agriculture for 1902 comments on this change as follows: "The valley of the Arkansas river, in Kansas, forty years ago entirely treeless, appears now to the casual observer to be as fully timbered as the valley of the Wabash, which was once entirely forested."

Here along the Arkansas valley practically all the forest-trees common to the Mississippi valley grow. It may not be generally known that in the eastern portion the pecan tree grows in a state of nature to such an extent and over such large areas that the gathering and marketing of the pecan nuts in the fall of the year has come to be an industry of considerable importance. "Purely as a financial investment," says the Bureau of Forestry of the United States Department of Agriculture, "large plantations of Hardy catalpa, Black locust, Red cedar and Osage orange have been established on the very best agricultural land, and compete favorably with wheat and corn as money-producing crops." The trunks are used for railroad-ties and fence-posts. The tops and limbs are converted into cord-wood and sold at remunerative prices for fuel. Private individuals and public corporations have made paying investments in tree culture. The most important plantation made by railroads was that belonging to the Kansas City, Fort Scott & Gulf railroad, at Farlington, Kan. The following interesting letter with reference to the work was written by the firm that furnished the trees:

"We furnished the trees for the Kansas City, Fort Scott & Gulf railroad (now the Kansas City, Fort Scott & Memphis railroad, later called the "Frisco") and for the president of the above road. This plantation (railroad) is at Farlington, Kan., and the Hunnewell plantation is four miles west of Farlington. At first the railroad bought the trees and the section men planted them. Possibly 50,000 trees were so planted up to 1878. We sold Mr. Nettleton, the general manager of the road, chestnuts, walnuts, and wild Black cherry (a total of 12,500), White ash, and European larch. In 1878 we grew for them, under contract, 100,000 catalpa (*speciosa*) and 25,000 Black walnuts. In 1879 we took the contract of planting the balance of the section—they to furnish land for us to grow the seedlings on and to break the prairie sod and to cross-plow it when rotted; we to then plant and take care of the trees till they were from four to six feet high. They were planted four by four feet, 2722 to the acre; we to get one and one-half cents per tree when turned over. A large part—at least three fourths—of the trees planted were catalpa (*speciosa*). A large number of ailanthus (*glandulosa*) were also planted. These two kinds of trees did well. The chestnut, larch, White ash and wild Black cherry were an almost utter failure. Over 3,000,000 plants were set out. In 1881, I believe, we sold the Iron Mountain railroad 200,000 catalpas."

With the advent of the canning factory, an institution distributed over the state, the production of vegetables, especially tomatoes, has invited unusual attention. The returns from tomato yields exceed the credulity of those not directly connected with the production of such yields. Tomato culture, to be profitable, is intensive rather than extensive. The early spring favors early field planting, and the production of fruit in time for the best-paying market prices. Truck-farming, as it is sometimes called, utilizes much of the land in the vicinity of the large cities, especially around Topeka, Wichita, Lawrence, and Kansas City, where the retail grocers and commission houses furnish an ever-ready market. Naturally, wherever garden vegetables are largely used the early productions are the more highly prized, more sought after, and consequently bring a higher price. For this reason market-gardening under glass is an industry coming into importance. Eastern firms with large and successful experiences in this line have established extensive greenhouses for the production of garden vegetables during midwinter.

And in this matter of forcing vegetation under glass Kansas is only keeping pace with the trend of the times along this line. Professor Galloway says: "Probably nowhere in the world has the growing of plants in greenhouses attained such importance as in the United States. Other countries may have more imposing structures and larger individual areas of glass, but, taking the business as a whole, it may be fairly claimed that in up-to-date methods in almost everything pertaining to this special field of horticulture this country leads. The growth of the horticultural industry in recent years has been remarkable, probably 100 per cent. in the last ten years, and no small proportion of the increase has been due to the extension of culture under glass."

One of the chief advantages which Kansas offers to the horticulturist arises as a result of many favorable conditions taken together. In the first place, Kansas is a comparatively new state; in the second place, practically all the horticultural stock set out is propagated in Kansas; consequently Kansas is free from those pernicious insects and blighting plant diseases which have been introduced into other commonwealths and exist as a serious menace to the horticultural interests of those regions.

We take it that the opinion of those who have traveled widely and have had varied experiences in horticulture are worthy of consideration. In such a class is the Hon. H. E.

A Kansas Fruit Display.

Apples in Leavenworth County.

Van Deman, of Parksley, Va., who is the originator and former chief of the division of pomology, United States Department of Agriculture. Speaking of the comparative position of Kansas as a fruit-growing state, he says:

"Situated in the center of the United States geographically, irrespective of Alaska, Kansas holds an enviable position. She is convenient to all parts of the country by rail. She is in direct line of travel from east to west. Her railroads are enterprising and belong to some of the largest systems in the country, and her fruits can be carried by them anywhere that they may be wanted.

"If such fruit as is grown within her borders is scarce in any section of the North, West, East, or South, it may be sent as quickly and as cheaply as from almost anywhere, and more so than from many other states, unless there is unjust discrimination on the part of the roads. The climate of Kansas is suitable for the growth of nearly all the leading species of fruits that grow in North America. There are some, however, which are not grown with the success that we would like, and a few that will not succeed at all. The winters are sometimes quite cold, reaching twenty-five degrees below zero in some rare cases, but as a rule they are what we call mild. My own experience of nearly eighteen years as a resident of Kansas, in time past, warrants me in speaking on this point. Nor are the winters very long, as we of the larger part of the United States experience them. Outdoor horticultural work may be done late in the fall—sometimes up to December 1—and in early spring. I have done planting there as early as the last of February and early in March.

"The soil of Kansas is good for fruits. Most of it is rich in potash, phosphoric acid, lime, and humus, with nitrogen enough to stimulate vigorous growth. There are clay and sandy soils in all their gradations, except that there are not many places where it is too poor to grow anything to profit.

"The apple is, of course, the principal fruit of Kansas and the world. The largest apple orchards here belong (as they do elsewhere) to up-to-date horticultural students, viz., to my esteemed friend, F. Wellhouse, the president of the State Horticultural Society, and his son. Other large apple orchards are almost immediately east or west of Kansas, part being in Missouri and others in New Mexico and Colorado. Kansas is clearly in the greatest apple-growing region of the world. Not all varieties succeed here. After the first generation of apple trees had passed away, or were regrafted in so far as was necessary, and the people learned that some of the old standard winter varieties of the Northeast, such as the Baldwin, Northern Spy, and Rhode Island Greening, were only fall apples in Kansas, and what varieties were suitable for the different seasons, there has been little trouble to have plenty of good apples at all seasons.

"The winter apples of Kansas may be kept the year through, or nearly so. At the New Orleans Exposition, during the winter of 1884–'85, there was a good chance to test the keeping qualities of apples from almost every state that pretends to grow apples. As I had charge of a large exhibit from Allen county, Kansas, I know from experience just what they did, and, from observation, what those from other states did; for I watched them very closely all winter. As to quality, there is no question about the summer and fall varieties being fully up to the best that are grown anywhere; but it is perhaps true that the winter apples of Michigan, New York and the New England states are somewhat crisper and more sprightly in flavor. They have the Northern Spy and Rhode Island Greening, that are hard to equal anywhere, and Kansas has the Jonathan and Winesap, which are very close competitors, as grown in their respective localities.

"I saw Jonathan, from Kansas, in New York city this fall, that sold at five dollars per barrel, which is a top price for the best Northern Spy or Esopus Spitzenberg during almost any time of scarcity; but the Jonathan will not keep so late as the others. The season for selling them is very short. But it is certain that in the larger part of Kansas no country family need go without apples of delicious quality for home use, if they will plant wisely and work faithfully."

It is for the purpose of illustrating the horticultural possibilities of Kansas that some of her home-grown fruits are placed in a position here in the Horticultural Building of the Exposition, where they may be allowed to speak for themselves, as it were. If the reader is interested in the size of apples, his attention is called to specimens of the Wolf River variety, eighteen of which weighed twenty-one pounds. If he desires to see the right colors and flavors combined in the same apple, he should see and taste the Kansas-grown Jonathan apples. If he be interested in nursery stock or growing plants, it will be to his interest to give the representative plats of Kansas plants and trees growing now on the Exposition grounds due examination. He will also find well-informed persons in attendance upon these exhibits, who will cheerfully answer questions.

Kansas horticulturists are enthusiastic in their predictions for the horticultural future of the state. They welcome their friends and the friends of Kansas, as well as those who would like to be friends, to the Kansas horticultural exhibits at the World's Fair, at St. Louis. They will as gladly welcome visitors to their home grounds, where these many varieties may be seen growing under natural conditions.

A 270-acre Apple Orchard in Leavenworth County.

MINERALS

BY

G. P. GRIMSLEY. TOPEKA.

THE story of Kansas' wealth is not only to be told in the farmhouse and at the plow, but it is repeated in the mine shaft and at the derrick. The state's resources are clearly seen on the surface, but this wealth is far from superficial and it extends below the grass roots, and is brought to the light of day by pick and drill, to be converted into useful products, enriching a state and nation.

Twenty years ago the products comprising these mineral resources of Kansas were but four in number—coal, stone, lead, and zinc—with an annual value of about $2,000,000. To-day these industries are twelve in number, with an annual value of almost $30,000,000—over a million increase a year, and development never so rapid as at present.

COAL.

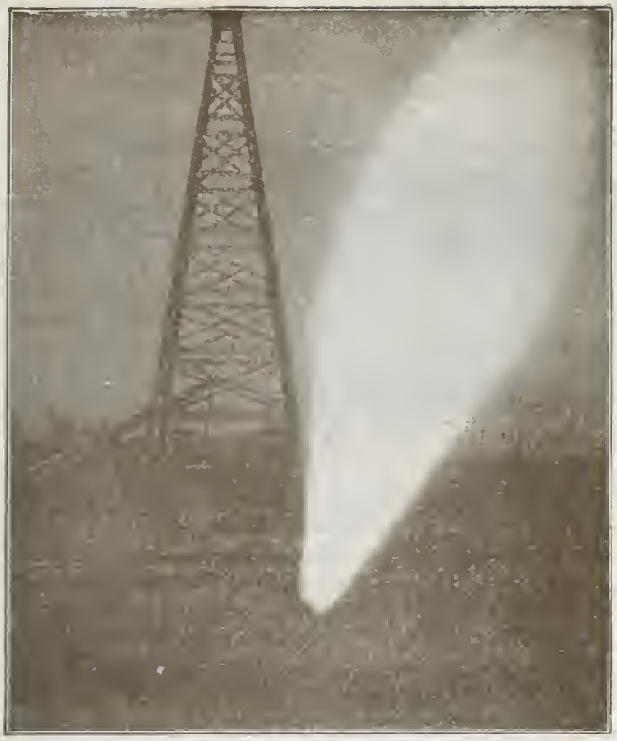
Coal was one of the first mineral deposits to attract attention in this state and it is now the most important mineral. Thirty-five years ago the settlers of Cherokee county warded off the chilly blasts of winter by fires of coal taken from the neighboring creek banks. To-day twenty-nine counties are producers of coal in considerable quantity. Six of these are mining brown coal (or lignite) in small amount and are situated west of the main coal area; while twenty-three are in the eastern part of the state, in the Carboniferous formation of the geologists. More than eighty-eight per cent. of all the coal mined in the state comes from the Cherokee shales, at the base of the Coal Measure system of rocks, and mainly within the limits of two counties, Crawford and Cherokee. The largest coal-hoisting shaft in the west is located at Chicopee, in Crawford county, which is the banner coal county in the state. Ninety-eight per cent. of the Kansas coal comes from six counties: Crawford, Cherokee, Bourbon, Labette Leavenworth, and Osage. In southeastern Kansas there are about thirty separate coal seams, ranging in thickness from eight inches to nearly four feet. There are 250 coal-mines in the state, in depth varying from a few feet to 720 feet, at Leavenworth.

Near the middle of the Cherokee shales is found the heaviest and best coal seam in the state, known as the Weir City or Pittsburg coal, with an average thickness of forty inches. This seam is mined by shaft and by stripping in southeastern Kansas, and the seam is reached by deep shafts at Lansing, Leavenworth, and Atchison, in the northeastern portion of the state.

Twenty-two hundred feet above the base of the Cherokee shales comes the Osage coal, mined in Osage county, and found in the counties northeast and southwest of this county across the state. The mining of this coal commenced in 1869 and its average thickness is sixteen inches. Above the Osage coal horizon, no coal in paying quantity is found in the Coal Measures of the state.

The work of the University Geological Survey has shown that the Kansas coals compare very favorably with the bituminous coals of the Mississippi valley, and the Pittsburg coal is to be compared with the soft coals of Ohio and Pennsylvania. From the government tests made some years

Coal Shaft at Chicopee.



A Gas-well on Fire

ago, the highest heating power found among the different coals of the United States tested was from the coal at Weir City, Kan. The average percentage of coke produced from Kansas coals was 62.8, while the highest determined elsewhere was 66.7 per cent., from the Illinois coal.

The coal areas of Kansas are very fully described in volume III of the University Geological Survey of Kansas, and there it is stated that, with all allowances, there would be in Kansas 4000 square miles of coal-producing territory, with an average of two and one-half feet in thickness. A stratum of coal two and one-half feet thick would produce per square mile 1,920,000 tons. At the present rate of mining coal in the state, this supply would last 2000 years.

An examination of the statistics of coal-production shows that there has been a steady growth in tho production of coal from 1880 to the present time, with the exception of the years 1893 and 1895. The state holds tenth rank among twenty-seven producing states, and yields nearly two per cent. of the total coal supply, or about 6,000,000 tons a year.

NATURAL GAS.

Natural gas has displaced coal for fuel in a large section of southeastern Kansas, and has given a new impetus to the manufacturing interests of Kansas. Twenty years ago the industrial world awoke to the fact that another form of stored fuel existed in the deep recesses of earth, and the natural-gas excitement was ushered in, reaching its height about 1886. The northern Ohio farm lands took on the aspect of mining camps, and small villages grew rapidly into manufacturing cities.

Legendary and historical records show that natural gas has been known at a number of places in Kansas from an early day. Some gas was discovered in wells bored for oil at Paola in 1865, but this field was not developed until 1882.

OIL.

Oil development commenced in Kansas years ago in a very humble and unpretentious way. In the early '70's a well dug for water in Johnson county was noted for its scum of oil which daily accumulated on its surface. The oil was of a heavy type, and furnished a very fair and very cheap wagon grease for the "Westward, ho!" emigrants. Its value was small; its future possibilities were unseen. Gold first and home second were not to be found here, but further in the West. Some years later prospect wells were put down for oil, but they were failures, and interest in the subject waned, and was almost forgotten. A score of years passed away, and a well was drilled at Independence

In the Chanute Oil-field.

Oil-fields, Cherryvale District.

to a depth of 884 feet, resulting in a discovery of oil in paying quantity. In 1893 Guffey & Galey began their operations in this part of the state and leased 7000 acres. They drilled sixty-eight wells in the Neodesha area, and most of them were productive. In 1895 they sold their interests to the Standard Oil Company, which erected the oil refinery at Neodesha. This company to-day controls the refined oil in the Kansas fields, and has expended over $1,000,000 in its development.

GEOLOGY OF OIL- AND GAS-FIELDS.

The surface rocks of eastern Kansas belong to the Coal Measure series of the Carboniferous formation. This is higher in the geological scale of rocks than the fields of the East. The thickness of this Coal Measure series from the base to the top has been estimated by the state survey at 2750 feet. At tho bottom, resting on the Mississippian flinty limestone, are the Cherokee shales, about 400 feet, which contain important coal seams and some sandstones. It is in these sandstones that tbe gas and oil are found.

THE KANSAS OIL- AND GAS-FIELDS.

The attention of American oil men is now centered on the remarkable development of the oil-fields of Kansas. In the past year the output has increased fourfold, and 1904 will doubtless break the past record. This oil and gas area of Kansas is said to extend from Kansas City west to Lawrence, and east of a line drawn from the last point southwest through Chautauqua county. At the present time all of this area is not proven ground. The developed area starts near Paola and extends south, and the drills are at work in the various parts of the southeastern area, with varying success. A brief review of this development will now be given.

Kansas City-Fort Scott Area.—The report of natural gas in Kansas, written by the late Professor Hay, in 1886, stated that a small volume of gas was found in three wells near Kansas City, at a depth of 400 feet, and it was used with coal in some of the flour-mills and brick-works. A few small-volume wells were also drilled at Fort Scott. This development, however, was never sufficient to attract much attention. More recent drilling at Fort Scott failed to find any volume of gas, though it is still maintained by interested companies that gas will yet be found at Fort Scott. Before condemning this locality, one should keep in mind the experience at Chanute, where the first drilling gave little or no promise of any gas or oil.

Paola-Osawatomie Area.—A small field has been developed in this section, where the wells range 400 to 900 feet in depth, yielding, when first drilled, about 2,000,000 cubic feet of gas daily. The wells are located to the southeast of the town of Paola, and several near Osawatomie. The field has declined in volume, but some new wells drilled in the past year are said to give much encouragement for the life of this field.

Greeley.—This town, located in Anderson county, now has five gas-wells, four of which are used at the town. These wells are of low volume, but hopes are entertained of developing a larger field.

Spring Hill has several small wells, used for light and heat in the town, and the development at this town is interesting because of the northward extension of the Kansas gas territory, and it is usually omitted in the descriptions of gas fields of the state.

Iola-Gas City-La Harpe Area.—The Iola gas-field has attracted more attention and the gas has been utilized to a greater extent than any other field. The first gas was found in the Acres mineral well in 1871, but the development came in 1894. The developed area is twelve by six miles, with over seventy producing wells. These wells vary in volume from 2,000,000 to 10,000,000 cubic feet in twenty-four hours. The wells are drilled to a depth of 815 to 920 feet, and had an original rock pressure of 325 pounds.

The gas is used at the zinc smelters, which have a daily capacity of 300 tons, reduced from 700 tons of ore, in 20,000 retorts This yield is one-half of the total product of the United States. The gas is used at the cement plant, which has a daily capacity of 2500 barrels. It is also used in the various factories, mills, and brick-yards. The gas-producing area commences a short distance west of Iola, and extends east through Gas City and La Harpe. In the wells drilled west of the gas area oil was found, but so far only in small quantity and of poor quality. In January of the present year oil was found in some of the new wells near La Harpe. The Iola belt is essentially a gas-field, and this cheap fuel has made out of a town of 1500 people a city of nearly 10,000, with manufacturing industries which pay monthly in wages over $100,000.

Humboldt Area.—To the south of Iola, at Humboldt, gas is found, and is used at the brick-works, mills, and for household use in the town. These wells reach the Iola limestone at thirty feet, and pass through it in forty feet more. The Cherokee shales were struck at 635 feet, and the well at 970 feet was still in these shales. The first oil-sand was struck at 796 feet, and other oil-sands at 894 and 915 feet. Humboldt is now noted for its oil-field, which is a continuation of the Chanute field. At the present time there are over sixty wells producing oil, owned by twelve companies. Very few dry holes have been encountered in this field. An independent refinery is now in operation at this town. It is the property of the Webster Refining Company, and has a capacity of 250 barrels daily, with storage capacity of 7000 barrels.

Chanute Area.—The early prospecting carried on at Chanute was not successful. The Cherokee shales were found at 549 feet, with a thickness of 421 feet; a sandstone was found at 806 feet, but it was without gas or oil. Gas was piped from Benedict, but in 1899 the city appropriated money to drill for gas, and found it in three wells. The city then purchased the Benedict pipe-line, and now controls the gas rights for the town. The present city plant, with its various extensions, has cost $100,000, and has been paid for out of the revenues in a little over three years. The city now owns nineteen producing gas-wells. The gas development has been followed by the oil, and to-day the Chanute district is the great Kansas oil field. In this area there are not far from 200 producing oil-wells, with a flow of twenty-five barrels, after sixty days. The field now has probably 300 miles of pipe-lines, and 100 drills are at work extending the developed area. The daily capacity of the field cannot be determined, as none of the wells are pumped to their flowing capacity. This fact has led to some very low estimates of the field. The present production of the field, with a considerable number of wells not yet connected with the tanks, is about 2500 barrels, and the oil passes through a pipe-line directly to the Neodesha refinery.

Thayer.—The Thayer field was developed by the Standard Oil Company, and there are now seventeen wells,

Oil Refinery at Neodesha.

Gypsum Bank near Burns.

from which the oil is carried by the pipe-line to the Neodesha refinery.

Cherryvale.—In 1888 bonds were voted by the town of Cherryvale to prospect for coal near the town, and in 1899 gas was struck at 650 feet, with a volume of about 2,000,000 cubic feet daily. The Cherryvale Gas Company was then organized, and drilled in the next few years eight or ten wells, which were used to supply the town and small manufacturing plants. Attention was thus drawn to this locality, and other companies were organized to develop the area. At the present time there are over eighty gas-wells, ranging in volume from 1,500,000 to 10,000,000 cubic feet. These now supply gas to the largest brick plant in the state, the largest iron foundry in southeastern Kansas, to the largest zinc smelter in the world, to the glass works, and other manufacturing plants. The gas development alone would be sufficient to mark this area as an important field, without any reference to oil. In some of these early gas-wells oil was found in considerable quantity, and was used at the brick-works, and for other local uses. In drilling for gas northwest of town, oil was found in several wells, and the Federal Gas and Oil Company was organized, and drilled a number of good oil-wells. In June, 1902, the Illinois Valley Company secured leases on the top of the mound, above the Federal leases, and they have twelve wells on the so-called Kansas "Spindle Top." This group of derricks, high on the hill, is a conspicuous landmark, visible for miles. Ten other companies are developing oil-fields near Cherryvale. There are about forty oil wells, and ten drills at work on new wells. The wells are drilled 650 to 900 feet, and the oil-sand reaches twenty to forty feet in thickness. The gas-wells will probably average 4,000,000 cubic feet, and the oil-wells average fifteen to twenty barrels. The developed field is about six by ten miles, and but few dry holes are found.

Coffeyville Area.—This field was opened in 1892, and was developed by the Coffeyville Gas Company. They developed a field about seven miles long, north and south, and three and one-half miles wide, or about the same size as the Iola field (seven by three). Down to 1900 fifty-four wells were drilled, and forty-four were producers of gas in greater or less amount, while ten were dry holes. The wells vary in depth from 460 feet, at the north, to 1007 feet, at the south. The volumes vary from 100,000 to 5,000,000 cubic feet, with an average of about 2,000,000. The rock pressure varies from 200 to 270 pounds. A new gas area has been developed in the past year, which begins about three miles

Gypsum Hills in Barber County.

west of the city, and is about four by fifteen miles in area, as estimated. The gas-sand is found about 150 feet lower than in the old field, and the volumes run from 7,000,000 to 10,000,000 cubic feet, with a pressure of 450 pounds. Nine additional wells have been drilled in this area. All the gas companies at Coffeyville are now owned by the People's Gas Company, and there are nearly 200 miles of pipe-line in the field. The gas is used at the town and in the brick plant, pottery, glass-works, and mills. A promising oil-field has recently been opened at Coffeyville.

Chetopa.—A number of shallow wells of low pressure have been found near Chetopa, and these are now supplying gas to that town.

Erie.—The Erie Gas and Mineral Company discovered gas near Erie in 1898, at a depth of 570 feet, with the sand thirty-eight feet in thickness. In the next two years nineteen wells were drilled. Twelve of these wells produce gas in larger or smaller amounts. In 1902 nine wells were drilled. Three of these were gas-wells and three oil-wells. The gas-wells run from 3,500,000 to 7,000,000 cubic feet. There are now nine oil-wells near Erie, but they are not yet in use. There are eighteen gas-wells. The gas-sand runs from twenty-five to forty-eight feet, and the wells are drilled to a depth of 514 to 840 feet. The best gas-sand is found between 490 and 555 feet, and the oil at 550 to 675 feet. So far in the present year, eight wells have been drilled, and only two of these were dry holes. Gas is supplied to the town of Erie, and only a portion of the available supply is used.

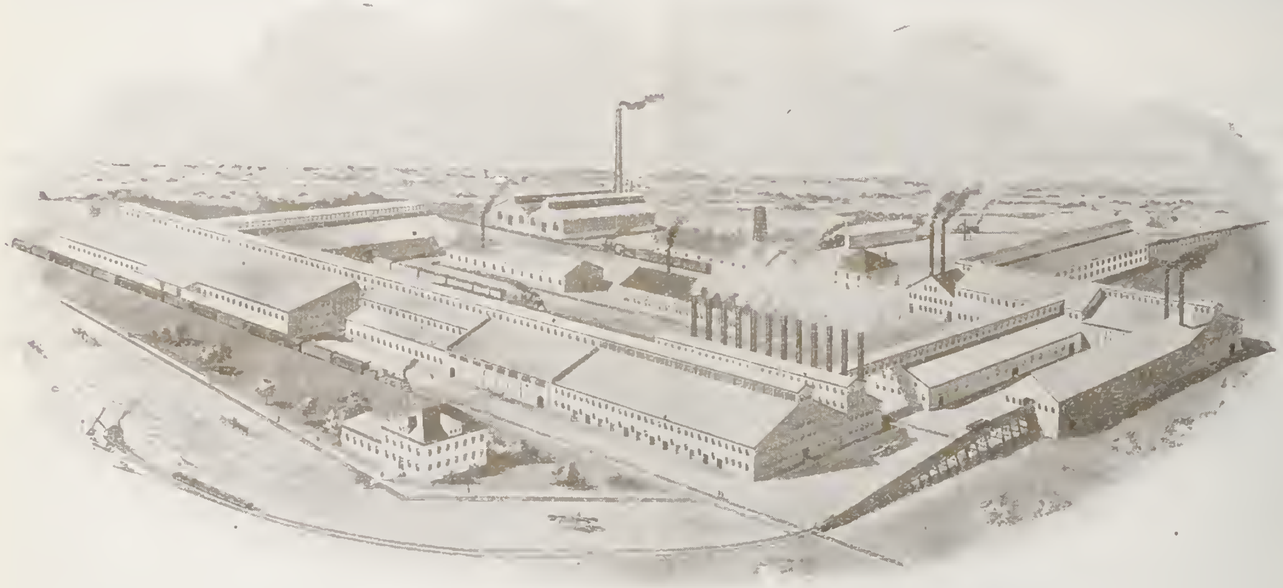
Fredonia.—Gas has been used for over a year at Fredonia, but was piped from near Neodesha. Drilling in the past near the town has proved unsuccessful, but in July, 1903, three wells were drilled west, north and east of town, at a distance of one-half to three miles, and gas was found at a depth of a few hundred feet. Some of the early wells, which did not yield enough gas for use, have been shot and are producing oil. This area is now in process of development.

Independence.—Prospecting for gas was carried on at Independence in 1890 by McBride & Bloom, and gas was found in small amount in four wells. In 1892 the first strong wells were found, with a daily flow of 3,000,000 cubic feet and a pressure of 315 pounds. The Independence Oil and Gas Company was organized, and now has nearly thirty gas-wells supplying the town and various factories. Two cement mills are now planned for the coming year, and the company supplies gas to the new brick-works at Sycamore, and also to the ornamental brick works at Independence. In January, 1903, attention was directed to the previous finds of oil in some of these wells, and active prospect work was started to develop an oil-field. The depth of the wells is 1000 to 1200 feet, and the sand runs from 5 to 50 feet. The maximum rock pressure found is 500 pounds, and the maximum gas flow is 16,000,000 cubic feet. The Independence Gas Company has leased 80,000 acres. The oil-field southwest of Independence, at Bolton, opened in October, 1903, has shown remarkable volumes, and is probably the richest oil area in the state. Three wells in this section have a record of 600 barrels a day, after three months' run. The average yield of wells in this pool is not far from 100 barrels a day. One well made 1000 barrels in the first 24 hours.

Neodesha.—To the east of Neodesha a number of gas-

Portland Cement Plant at Iola.

wells have been drilled, which vary in volume from 1,500,000 to 4,000,000 cubic feet flow, and have a rock pressure of 300 pounds. The gas is used at the town, and it is also piped to Parsons. This area is also known as one of the best oil-fields in the state. There are about fifty oil-wells located not far from Neodesha, with an average flow of about eight barrels. The oil-sand is fifteen to twenty-five feet thick, and is found 800 feet below the surface. At Neodesha is located the only oil refinery in the state. This is owned by the Prairie Oil and Gas Company, a branch of the Standard Oil Company. The oil from the various fields is brought on tank-cars of 6000 gallons capacity or through the pipe-lines to seven large iron storage tanks, located near Neodesha and Thayer, which have an average capacity of 30,000 gallons each. From these tanks the oil flows by gravity to the refinery, which has a daily capacity of 2500 barrels.



Portland Cement Plant at Independence.

Caney.— In 1885 Guffey & Galey drilled a well near Caney for Mr. Kellogg, a miller, and found both gas and oil. This well was afterward abandoned, and at the present time flows some oil. In 1896 a well was drilled east of town and produced oil, but it was never used to any extent. This well to-day is flowing some oil, and new wells drilled near it are producing wells. In 1901 the Caney Oil and Gas Company was organized and drilled three or four wells, two of which are still in use. They show the highest rock pressure yet found in the Kansas field—660 pounds. One of these wells had a volume of 4,000,000 cubic feet, and the other 14,000,000, and the wells were drilled 1400 feet in depth. Last fall prospect work was carried on to the east and west of Caney, and much territory was leased by the Cheyenne Oil and Gas Company. There are six oil-wells, and three drills at work. The oil is found at from 950 to 1300 feet, and it is of good quality and volume.

Chautauqua County.—Going west from Caney, one passes into Chautauqua county, which is now attracting favorable attention. Near Chautauqua Springs two oil-wells have been drilled; one in June, which is estimated to flow thirty barrels a day. At Niotaze gas was struck at 460 feet, with a flow of 3,000,000 cubic feet, and it is used at the town. The sand is eighteen to forty feet. Other wells are being drilled. At Rogers a small oil-well was recently drilled. At Cedarvale a well was drilled 1400 feet, finding twenty-five feet of sand, with oil in the upper portion. At Peru is the best-developed oil-field in this county. There are over thirty wells, and ten rigs at work. The oil-sand is found at 850 to 1000 feet, and the sand in places is fifty feet thick. Nearly every well finds oil and gas.

Buffalo.— Twenty-five oil-wells have been drilled at Buffalo and are small producers. The sand is struck at 1000 to 1014 feet. There are over thirty wells in this area.

Benedict.— A number of good gas-wells have been drilled at Benedict.

Winfield.— Gas has been found at Winfield, but not in paying quantities, and it is recently reported that a small flow has been encountered at Dexter. Gas or oil is also found at Shaw, Sycamore, Havana, Guilford, Coyville, Larimer, Neosho Falls, Moline, Toronto, Bolton, Le Roy, Moran, Elk Falls, Mound Valley, and Spring Hill.

General Survey of the Field.—The developed gas- and oil-field of Kansas, as found in southeastern part of the state, extends from Paola southwest into the Indian Territory. It is composed of a series of more or less disconnected areas, centering around the towns indicated in the preceding review. The greater development is to be traced from Iola south. Drilling between Chanute and Humboldt has practically connected these two fields. It has generally been believed that the Iola and Humboldt fields are clearly separated, and prospecting work to the south of Iola has never attracted attention. In the last few months extensive leases have been taken south of Iola, and drilling will soon commence.

The Cherryvale and Coffeyville fields have been brought closer together by drilling north of Coffeyville and south of Cherryvale. The Cherryvale and Chanute fields are about twenty-five miles apart, with the Thayer field between, and very little prospect work has been carried on above or below Thayer.

The Coffeyville field has been extended six miles west, leaving about fourteen miles area to the Havana field. It will be noticed that the breaks between the different areas are marked by places where no drilling has been done. Some of these non-producing areas in the past are becoming producing areas through the present drilling.

It seems to the writer that future development will close many of these breaks, and that in all probabilty we have in Kansas one large oil- and gas-field from Iola, and possibly north of this city, down into the territory. There is an impression abroad among many people that the oil and gas lands are now controlled, and there remains little opportunity for investment except by buying leases at high prices. This is true of the developed tracts, but there remain many acres of undeveloped land where the indications are good for oil and gas. The Kansas oil development has but started, and the future development will, without much doubt, be far greater than the past. There is room for many more wells in the developed tracts, and thousands of acres remain undeveloped. In 1902 the average daily production of oil in Kansas was 542 barrels, and in December, 1903, it was 7693 barrels. The total production for 1903, over 1,000,000 barrels, was five times that of 1902. There were close to 1600 producing oil-wells in the state January 1, 1904. Nearly 200 wells are added to the list each month. It is predicted by the *Kansas Derrick* that the oil-production for 1904 will be close to 7,500,000 barrels. Such figures prove that Kansas is one of the most promising oil-fields of this country, and the faith of these investors in our fields is well founded.

SALT AND GYPSUM.

Kansas holds third rank among the states in the Union in the production of salt, being surpassed in output by New York and Michigan. In the early days of the state's history, salt was obtained by evaporation in kettles of the water from the salt marshes which were located near the border of the present salt area in Republic, Cloud and Jewell counties. In 1867 salt brine was obtained for local use from a well seventy-five feet deep at Solomon City, and it was evaporated by the sun's heat. A second plant in the same region was built in 1874, and these are the only wells in the state where salt is obtained by solar evaporation.

Out of the wreck resulting from the disastrous boom excitement in Kansas in 1887–'88 there came many benefits. One of these was the development of the Kansas salt industry. In the former year, in Lyons, prospect holes were drilled for gas and oil. These fuel elements were not found, but at a depth of 800 feet a deposit of rock salt was found which was over 300 feet thick, made up of salt veins and shale layers. In 1891 the Lyons Rock Salt Company was formed and a shaft seven by sixteen feet was put down 1065 feet, through 265 feet of salt. A vein of good quality was selected, and thirteen feet of this is mined in rooms fifty feet square, by undercutting the rock with compressed-air channeling machines. The rock is shot down, loaded in two-ton cars, and hoisted to the top of the five-story mill, where it is run through crushers and screened into the different commercial sizes.

The capacity of this mine is 1000 tons in ten hours, though the average output is about thirty tons a day, employing 100 men. By analysis, the rock is 99.93 per cent. pure. The salt is shipped as far west as California, and it is distributed over a very large territory. The offices of the company are in St. Louis. A second rock-salt mine is operated north of Lyons, at Kanopolis. Two rock-salt mines are found at Kingman, although only one is operated.

Over ninety per cent. of the salt of the United States comes from evaporation of brines from deep wells. This is the method used in Kansas at Hutchinson, Sterling, Ellsworth, Wellington, and Anthony. The wells are drilled eight inches in diameter and cased down to 150 feet, or below the horizon of fresh water; then a six-inch hole is drilled down through the salt rock and cased to the top of the rock; a two-inch pipe is placed inside down to within fifteen feet of the bottom. Fresh water from shallow wells is forced down the inner pipe and this forces the saturated brine through the outer larger pipe into the storage tanks. From these tanks the brine flows down into the evaporating pans, which are of three types—the ordinary flat pan, with the heat directed against the bottom, the grainer pan, in which steam is used in pipes in the pan, and the vacuum pan. The fineness or coarseness of the salt in all of these methods is regulated by the amount of heat supplied—the greater the heat the more rapidly the salt

Shale for Brick-making, near Iola.

crystallizes from the brine and the finer the grain of the salt. The largest salt-evaporating plant in this country is located at Hutchinson, and is known as the Morton plant of the Hutchinson-Kansas Salt Company. It covers three acres, and its daily capacity is 1100 barrels. This company makes a special feature of a table salt known as the R. S. V. P. brand, which has a good sale even in the Eastern markets.

The area of the salt rock in Kansas extends from Ellsworth and Saline counties southward to the southern line of the state, and in breadth covers from two to three counties, with indications of salt outside of this area. The thickness of the rock runs from 300 to 370 feet, and it is of exceptional purity, running 97 to 98.5 per cent. of salt. In 1888, the first year of the salt industry in the state, Kansas ranked seventh in production, and from 1899 she has ranked third. In 1888 the production of salt in the state was 155,000 barrels, and at the present time it is about 2,000,000 barrels.

Gypsum.—Gypsum, or the sulphate of lime, is found in the state of Kansas in five forms: (1) The earthy form, gray in color, composed of loose, ash-like particles, rather light in weight, and formed from solution and subsequent deposition in water, known as gypsum earth or gypsite. (2) The compact variety, known as alabaster and massive gypsum. (3) Fibrous gypsum or satin-spar is usually found in layers, in the form of needles and prisms. (4) Foliated gypsum, usually in the form of small concretionary masses. (5) Spar gypsum, or selenite, is found in transparent, glass-like crystals, in veins or fissures in the massive gypsum and through the gypsum clays of Barber county.

Gypsum rock is quarried in fifteen states and territories, and the amount quarried in the United States is over 600,000 tons a year. Of this amount, Kansas, Iowa and Michigan produce 75 per cent. In 1903 Kansas produced 75,000 tons, ranking third—after Michigan and Iowa in tonnage, but holding second rank in value of the finished product.

The gypsum deposits of Kansas occur in a belt trending northeast-southwest across the state. The belt of exposed rock varies in width from five miles at the north to fourteen in the central part, and thirty-six miles near the southern line, with a length of 230 miles. This area is naturally divided into three districts: The northern or Blue Rapids area, in Marshall county; the central area, in Dickinson, Clay, Marion and Saline counties; the southern or Medicine Lodge area, in Barber and Comanche counties. From an examination of a map of the west-central United States, with the gypsum deposits marked thereon, it will be seen that if the northeast line of the Kansas deposits is extended it will strike the Fort Dodge area, in Iowa, and, if continued to the southwest, it will strike the extensive deposits of the Canadian river country, in Oklahoma and Texas. These deposits have been described in detail by the writer, forming volume V of the University Geological Survey reports.

The first deposits of gypsum rock worked in the state were in the northern area. In 1872 the Coon brothers, of Elyria, Ohio, built a frame shed on the Blue river, at Blue Rapids, and with a five-barrel kettle, heated by a stove, they commenced the manufacture of plaster of Paris. In 1875 they built a stone mill on the west side of the river, and the water-power was used for grinding. This mill was operated for twelve years, and then the firm unfortunately failed. The mill was afterward leased and run until the year 1889, when a flood caused considerable damage, resulting in the abandonment of the mill.

In 1887 the Fowlers formed the Blue Rapids Plaster Company, which has now been transferred to the United States Gypsum Company, with offices at Chicago. This company also controls the Winters mill, erected in this same section. Another prosperous company in this area is the Great Western Plaster Company, owning a very complete mill, which is now controlled by the American Cement Plaster Company, with offices at Lawrence, Kan. The mills at Blue Rapids use gypsum rock which is eight and one-half feet thick, and mined by stripping off the surface material, or by running an entry into the hill. The gypsum occurs as a gray, mottled rock, with sugary texture, breaking with irregular fracture. This gypsum runs ninety-eight per cent. pure, and can be used for the finest grades of white plasters.

These three mills are the only ones at the present time using the rock in this area, but the rock outcrops at a number of other localities in this part of the state, and is struck in the wells north, south and west of Blue Rapids.

Eight mills have been built and operated at different times in the central or Gypsum City area. Most of these used the earthy variety of gypsum. The discovery of other, larger deposits has caused their abandonment. At the present time there are two mills in this area working the gypsum earth and one working the rock, and one mill using both rock and gypsum earth. This interesting deposit of gypsum earth was first discovered in 1873, at Gypsum City, and first worked in 1889. The Kansas material used in the World's Fair buildings at Chicago came from this place, and many of the St. Louis Fair buildings are made of Kansas plaster. Other similar deposits were later found at Dillon and Rhodes, in Marion county; at Longford, in Clay county; at Burns, in Marion county, and at Mulvane, in Sumner county. At the present time the Ætna company is operating a mill near Dillon, working a sixty-acre deposit of gypsum earth of good depth, and manufactures the Ætna cement plaster. This company has recently remodeled its plant, adding new machinery; it also works a gypsum rock in a vein eighteen feet thick.

At Longford, the Salina Cement Plaster Company, of Lawrence, manufactures the Agatite plaster from a good deposit of gypsum earth. This company has other mills at Quanah, Tex., and Watonga, Okla. At Hope, in this same area, is a mill now owned by the United States Gypsum Company working the rock from a deep shaft. At Burns, the Kansas Southern Plaster Company has a small mill working the earth gypsum. One of the very complete Kansas mills was located at Mulvane, but it has been moved to Oklahoma.

The Medicine Lodge area, with its continuation southward into Oklahoma and Texas, forms one of the largest gypsum deposits in the United States. It is reached by the Santa Fe railroad, and there are only two small mills located in this section of the state at the present time. Near the town of Medicine Lodge the rock caps the hills as a layer twenty-five feet in thickness, protecting the underlying soft, red shales and clays, thus causing the very rugged topography, often likened to the "bad lands" of the further west. The mill at the town is engaged in the manufacture of a very high grade of plaster, known as Keene's cement, which is used in interior decorative work. At Springvale, the United States Gypsum Company has a mill making a reddish plaster, sold under the name of "Roman cement plaster." Some important deposits of gypsum, as yet undeveloped, are found on the Rock Island railroad.

There are nine plaster mills in the state. Five of these use the rock, and four use the gypsum earth. In the manufacture of plaster from gypsum nearly the same process is used in the Kansas mills, except the mills using the earth gypsum do not require the crushing machinery. The rock is crushed to fine flour in jaw crushers and buhr-mills. This flour is then run into the calcining kettles, holding seven to ten tons of rock flour, and it is calcined in about three hours, losing fifteen per cent. of water.

Ordinary gypsum plaster will set in five to ten minutes after water is added to it; so for plastering walls the set must be delayed, and this is accomplished by adding a "retarder" to the finished plaster, in sufficient amount to hold back the set two to six hours. These retarded plasters, and those retarded naturally through their chemical impurities, are sold under the name of "cement wall plaster."

The gypsum cement plasters are displacing the old lime plasters in all the larger buildings and in many private houses. The advantages of such plaster are as follows: Being a good non-conductor of heat, the cement plaster is valuable in fire-proof structures; it sets more rapidly and dries out much more rapidly than lime plaster, so that the finishing work in a house can follow directly after the work of plasterers; ceilings and walls soaked from leaking roofs are but little affected; the walls become dense and hard, and are vermin-proof. The main objection to the use of hard plasters has been the greater expense, costing, on the average, one-fourth more than ordinary lime plaster.

Kansas holds high rank in cement-plaster manufacture, but in the last few years the output has decreased in the state on account of the great development of the Texas and Oklahoma fields of earth gypsum. The most important field in size, located in the southern part of the state, is a few miles distant from the railroad, and this adds to the expense of handling the product, and practically excludes the construction of large mills. There are various rumors of new railroads in the area, and if built they will open a valuable gypsum field. The earth-gypsum deposits which now command the attention of the trade are being exhausted, but Kansas has large deposits of the rock which have as yet scarcely been opened, and these will form the basis of the plaster industry before many years. Kansas gypsum plasters are seen in nearly all the St. Louis Fair buildings, whose marble walls have come from the gypsum quarries of Kansas.

Lead and Zinc Mine at Galena.

Hydraulic Cement.—When an ordinary limestone is burned it forms a lime which will not set under water but disintegrates. It was early discovered that certain limestones when burned formed a lime which would set under water, and such limes were called hydraulic limes or hydraulic cements. A cement limestone is one which is impure, containing about twenty-five per cent. of sand and clay. Limestones of this kind are not uncommon in nature, but they usually run so irregular in their composition, even in the same quarry, that they cannot be used for the manufacture of cement. There are, in fact, very few good localities where a uniform rock of this kind can be found. The United States leads the world in the manufacture of this natural cement, on account of the high quality of the natural rock and the skill in manipulation.

At the present time Fort Scott is the only locality in Kansas where natural cement is made. Here the deposit of rock is of good extent and of very high grade, and it is burned into a cement of excellent quality, to be compared with the best of the American natural cements. The manufacture started at this place in 1869 and the first shipment was in 1870. The rock used at Fort Scott is a fine-grained limestone, of a blue-gray color, four or five feet thick, and found three feet below the Fort Scott coal, which is fourteen inches thick. The rock and coal are placed in alternate layers in the kilns and fired from the bottom. The shipping facilities are excellent over three lines of railroad. The Fort Scott mills are equipped with the latest and most-improved machinery and appliances for the production of cement of the highest quality at the lowest cost price. The mills are owned and operated by the Kansas City & Fort Scott Cement Company and the Fort Scott Hydraulic Cement Company, and have a daily capacity of about 1000 barrels. The product of these mills is marketed by the Fort Scott Cement Association, with general offices at Kansas City, Mo.

IOLA PORTLAND CEMENT.

For certain kinds of work an artificial hydraulic cement is better than the natural. Such cements were made a hundred years ago in England by burning the chalk and the river clays. When it set in the form of rock it resembled very closely the famous Portland stone, used in Westminster Abbey and other buildings, and was called Portland cement. Not many years ago all the product used in this country was imported from England and Germany, but it is now made at many places in this country equal to the best imported product. In the last few years the industry has been growing at a wonderful rate, and many new and large plants are now in process of erection. One of the very large plants is located in Kansas, at Iola, and it is the only plant of this kind in the state now in operation (February 1).

The plant of the Iola Portland Cement Company, representing a new and most important addition to the mineral resources of our state, deserves special attention. The first cement was made at this mill on June 16, 1900. Over 1000 cars of building material and machinery were brought to Iola for this structure, and the plan of the mill is a model of compactness, neatness, and adaptability for rapid and thorough work. The buildings are constructed of steel and cement, and are four in number.

Lead and Zinc Mines at Galena.

On the south and north sides are two buildings constructed alike, 360 feet long and 160 feet wide, and divided into three sections, devoted to pulverizing, burning, and final grading of the materials. The third building, between these two, is known as the headquarters buildings, in which are located the chemical and physical laboratories, the electrical room, machine-shop, and general supply-room. The building on the west side is the wareroom, 600 x 80 feet, and it is so arranged that the finished product passes by conveyors directly from the grinding-room into the warehouse, where it is loaded on the cars.

The materials used in the manufacture of the cement are a very pure limestone nearly free from magnesia, a clay with about seventy-five per cent. of alumina and silica. One thousand tons of rock are used every twenty-four hours. These substances are mixed in the proper proportion and then ground in a large rock-crusher which takes blocks as large as a man's hand, and has a capacity of fifteen tons per hour. The gravel from these crushers then passes into a dryer heated by natural gas, where it loses six per cent. of water, or sixty tons a day passing off as steam. Next, the gravel is ground in twenty-one Griffin mills, which grind two tons an hour, or forty-eight tons per day, to a fine flour which will pass through a 100-mesh sieve of 10,000 holes to the square inch. This flour is then conveyed to the fifteen agitators, large cylinders holding ninety cubic yards each, and it is thoroughly mixed in water by revolving propellers.

When the material is thoroughly mixed to the satisfaction of the chemist, it is carried into twenty-one rotary kilns. These are cylinders lined with fire-brick, and are sixty feet long, six feet in diameter. They are in constant rotation, and inclined downward slightly toward the gas-heated end, where the temperature reaches over 3000 degrees F. Each kiln has a capacity of 160 barrels in twenty-four hours. The mixed flour materials pass out of the kiln in the form of a hard clinker, which is carried by elevators over into the cooling-room. When cooled, the clinker is placed in a second set of Griffin mills, twenty-one in number. Each one of these grinds nine barrels (or 3420 pounds) in an hour to a fine flour. The finished cement now passes over into the storage-room, where it is run into barrels or sacks.

The present capacity of the mill is 3500 barrels (or 14,000 sacks) per day. By extending the mill, this capacity could be doubled in a short time. Gas is the power used to drive the engines, to dry the material, and to burn the cement. The total cost has been in excess of $1,000,000 for the entire plant. Every detail of the manufacture is under the eye of an expert chemist, and all mixtures are most carefully examined. The high quality of the Iola Portland cement is due to the materials used, the completeness and perfection of the mill and machinery, and especially to the expert labor employed.

The initial set of Iola cement made through a period of days does not vary over ten minutes, and the final set varies but little from four hours and ten minutes. Ninety-five per cent. of the cement will pass through a sieve of 10,000 holes to the square inch. Iola cement tested without sand will reach a tensile strength of 800 pounds in seven days, and 1000 pounds in twenty-eight days. With three-parts sand, the cement after seven days breaks at 320 to 375 pounds, and after twenty-eight days it reaches 500 pounds. These tests show a very high quality of cement, and the tests of hardness and resistance to disintegration on boiling show that we have in Kansas a cement mill making a Portland cement equal to the best in the country.

The Iola Cement Company is a new organization, whose works are now completed, with a capacity of 2000 barrels daily. It is located east of the town, and is controlled by Iola people. At the time of this writing no cement has been made at this mill, so no tests are available; but the high class of the Iola materials for cement manufacture would argue for a high quality of cement.

The Western States Cement Company has been organized to build a 2500-barrel cement plant at Independence. The materials at this place have been carefully tested and promise good results. Work is expected to commence on these works this spring. The plant is controlled by the Cowham Cement Company, of Jackson, Mich., which operates four other plants of large size. Other cement plants are projected in the state, which has a supply of good materials for this work, and a cheap and convenient fuel in the large deposits of gaseous fuel.

BRICK MANUFACTURE.

Clay or shales in Kansas are used at Iola for the Portland cement manufacture, and at Fort Scott and Coffeyville for pottery. The great clay industry of the state is, however, the manufacture of brick and tile. At the present time the brick companies of the state represent an investment of over $1,000,000. The total value of the product last year was nearly $2,000,000. During the year 75,000,000 common brick were made, also 50,000,000 paving brick, and 10,000,000 fancy or ornamental brick—giving a total of 135,000,000. These brick were burned with coal and gas, at a fuel cost of $175,000. If the Kansas brick plants would work at their full capacity, they could produce in one day 1,500,000 brick.

The Kansas brick industry is to-day more valuable than all the mineral products mined twenty years ago in the state, and it is rapidly increasing. There are in the state forty brick plants of considerable size, not including many small, one-kiln yards, which supply a limited local demand. Of these fifteen are using gas for fuel.

In this state shales are used more than clay, the shale representing a clay which has hardened into a more solid form of rock, and is made up of layers. This shale is removed from the bank or pit by blasting, and shoveling the broken material into cars or carts which are hauled to the mill, located usually close to the deposit.

Common building brick were about the earliest products made in this country. The necessary materials are widespread, and no great skill is required in their manufacture, so that these small brick plants are familiar sights. Many towns in Kansas have such kilns, either in operation or abandoned after they have supplied the home trade. Such brick are made from surface clays, dried in open yards, and burned in up-draft kilns.

In the manufacture of sewer-pipe a slightly plastic clay or shale is used. The shales are ground, tempered, and passed through a pipe press. This is a two-cylinder press—the upper or steam cylinder and the lower or clay cylinder. A piston is driven from the steam cylinder through the lower one, forcing the clay through a die. The clay of the proper length is cut off by wire or a knife, and the pipe is removed, carefully dried in the dry-rooms, and burned in circular, down-draft kilns. The surface of the pipe may be glazed with salt, which is added to the fire before the burning is completed.

The only sewer-pipe plant in Kansas is that of the Pittsburg Brick, Pipe and Conduit Company. This company has at its plant at Pittsburg twelve down-draft kilns, with a capacity of 150 tons of clay a day. It is shipping an average of 160 cars of pipe a month from this place. The works were started in the fall of 1900, and have met with marked success.

The Pittsburg Clay Works' plant was built in January, 1902. It is one of a series of plants in the United States owned by the Custodis Chimney Construction Company, which manufactures perforated chimney blocks for high chimneys, 150 to 365 feet. These blocks are made in different sizes, but concentric, so as to fit closely together, with broken joints, giving great strength to the structure. The capacity of this plant is seventy-five tons a day, and since the opening of the work this plant has run at its capacity.

The largest company manufacturing brick in the state is the Coffeyville Vitrified Brick and Tile Company, with its plants located at Coffeyville, Cherryvale, Independence, and Chanute, with a daily capacity of 400,000 brick, burned in thirty kilns. This was the first brick company in the state to use natural-gas fuel. It makes paving brick of very high grade, and is the sole manufacturer of the Stich patent locking paving brick. The ornamental brick made at the Independence plant of this company is well and favorably known through the state and neighboring states. They are made in a large variety of patterns, and have been used in the government buildings at Fort Leavenworth, and the public buildings of the Southwest. Beautiful effects are produced in mantel construction by the use of these brick. The company not only markets its full capacity of the kilns, but purchases brick from other high-grade plants in the gas region, in order to supply its rapidly growing trade.

The Lawrence Vitrified Brick and Tile Company has a daily capacity of 40,000 brick, burned in five down-draft kilns and one up-draft kiln. The brick are dried by steam in a twelve-tunnel dryer, and the clays are ground in a nine-foot dry-pan and in a steel pug-mill. The company commenced operations in the fall of 1899, and is working a shale deposit which shows a thickness of thirty feet. It supplies the paving brick for the city of Lawrence, and is shipping into other cities. The brick is held in high favor by engineers.

The Atchison Paving Brick Company has six Eu Daly down-draft kilns, with a six-tunnel dryer, with a daily capacity of 30,000 brick. The plant has been in operation for over twelve years, and has a dry-press equipment of 15,000 brick, but on account of the demand for paving brick this has not been in use for some time. The company makes its brick from a blue shale, which is found in a pit fifty feet in depth.

Two other small plants are operated at Atchison, by Naas Brothers and by Walters, having a daily capacity each of about 15,000, and they use the ordinary up-draft kilns. They manufacture building brick in various shades of color.

At Iola, the Iola Brick Company has two plants using blue shales and natural-gas fuel. They make a very popular building brick, of good color, and paving brick, and their daily capacity is 100,000. The Star Brick Company, at Iola, has a daily capacity of 25,000 brick. A new plant of 75,000 capacity has been completed at Iola this past year. East of Iola, at La Harpe, the La Harpe Brick Company has a modern plant, using shales and gas fuel.

At Cherryvale is the plant of the Coffeyville Brick Company, the largest plant in the state, and the plant of the Cherryvale Brick Company and two other plants, making a high grade of building and paving brick with gas fuel.

At Altoona, the Kansas Buff Brick Manufacturing Company has a plant of 40,000 daily capacity which makes a high grade of ornamental buff brick.

In the Galena Lead and Zinc District.

The Humboldt Brick Manufacturing Company is located at Humboldt, and was organized by local capital in the summer of 1897. They erected a plant of 25,000 capacity, which was later enlarged to 50,000 daily capacity. Shale is used and the brick are pressed in oil; then burned with gas from wells a short distance away. The company makes building and paving brick, and makes a special feature of a fancy sidewalk brick which is very popular.

At Pittsburg, the Pittsburg Vitrified Paving Brick Company has fourteen kilns, with a daily capacity of 100,000. This is the second largest company in the state. It also owns a plant at Leavenworth, operated under the name of the Missouri Valley Brick Company, which has a capacity of 60,000, burned in nine kilns. This company has erected a large plant at Sycamore, north of Independence, where it uses gas fuel. This paving brick holds high rank in the markets of the West.

At Coffeyville are located the plants of the Coffeyville company and a new plant of the Coffeyville Shale Brick and Tile Company. At Caney is the plant of the Caney Brick Company, using gas fuel.

The Salina Vitrified Brick Company is the largest brick company in that part of the state and was organized in 1899, and the plant has a daily capacity of 30,000 brick. At Clay Center is the plant of the Clay Center Brick Company. At Topeka two plants are located west of the city, and they manufacture paving brick of high grade. These plants have a daily capacity of 75,000. At Willard a new pressed-brick plant has recently been started, making a building brick of rich color.

Other brick plants are found at Emporia, Paola, Fredonia, Horton, Columbus, Parsons, and Topeka. There are many good locations for brick plants where there are good shales and clays and cheap fuel, and more plants will undoubtedly be started.

There are at the present time only two potteries in the state, one at Fort Scott, which makes a specialty of stoneware, and a larger one at Coffeyville, which manufactures stoneware and ornamental pottery. This last plant is being enlarged in its variety of ware, and its ornamental glazed ware is attracting much attention at the present time. It is the only large plant devoted to art pottery in this part of the country.

At the present time the Coffeyville Roofing Tile Company is completing its large plant west of Coffeyville. This plant will be in operation this spring and its experimental work shows it can make a high grade of roofing tile, of good shade of color and of high strength. It is to be a modern plant, with the best of machinery and operated by skilled men.

BUILDING STONE.

The Kansas limestone is used mainly for building and road material, and the state ranks twelfth among thirty-eight producing states and territories. The productive counties are: Cowley, Leavenworth, Marshall, Allen, Franklin, Chase, Geary, Riley, Butler, Lyon, Wyandotte, with smaller amounts from twenty-five others. Most of the rock comes from near the towns of Manhattan, Atchison, Leavenworth, Topeka, Strong City, Cottonwood Falls, Fort Scott, Augusta, Winfield, and Arkansas City. The largest quarries in the state are at Strong City, on the Santa Fe railroad. Some of the stone will stand a crushing force of 19,279 pounds, and the analyses show the percentage of carbonate of lime to range from 97.32 per cent. at Garnett, Manhattan, and Galena, to 51.05 per cent. near Marion. Most of the rocks are fossiliferous, and some take a very fine polish, and are locally called marble.

Sandstone is found in all parts of this state in greater or less amount, but the productive portions are in the southern and northwestern parts of the state, especially in Bourbon, Phillips and Rawlins counties, and on the line of the Union Pacific road west of Salina. Paying quarries are in operation also in Crawford, Woodson, Clark and Wilson counties, and good ledges have been found in Kingman, Harper and Comanche counties. The product has been decreasing very rapidly from 1880 to 1894; 1895 shows three times the amount of 1894, but the production has since declined again. Kansas ranks tenth in sandstone output among forty-one producing states and territories. The picture of the Kansas state-house on cover of this folder shows the use of Kansas limestone in large buildings.

LEAD AND ZINC.

The second mineral in importance in Kansas is zinc, and, as lead is so closely associated with it, the two are considered together. The records of the year 1866 show that some lead ore was found that year in Miami and Linn counties, Kansas, but no large deposits were ever found in those counties. In 1876 a well-digger in Cherokee county struck in a well a deposit of lead ore, and then came the great lead and zinc excitement of southeastern Kansas, though the date of the first discovery in this section is said to have been in 1868. In 1877 the Short Creek valley deposits, close to Galena, were found, and the mining industry became firmly established in that section. Few, if any, men of that time even suspected that Kansas was to become the first state in the Union in zinc smelting, and that the markets of the world would be controlled to a large extent by the shafts of the Short Creek valley. Two cities were soon chartered —Galena and Empire City; thousands of people flocked in; fortunes were made and lost; and these towns became typical mining camps.

The lead- and zinc-producing area of Kansas is not large in surface extent, covering about a township, in the extreme southeastern part of the state, in Cherokee county, between Short creek on the north, Shoal creek on the south, and extending to about four miles west of the Missouri state line, though recent investigations are extending this area.

Zinc Reduction Works at Iola.

The main mines are within or near the town of Galena, which was formerly known as the Short Creek mining district. The ore is obtained from shafts 50 to 120 feet deep, and it is associated with white and black cherts and clay. In 1878, 143 tons of lead were removed from this district, but no zinc. In 1902, 4329 tons of lead and 34,929 tons of zinc were mined. Part of the lead is sent outside of the state for smelting, but there is one large lead smelter located at Galena. The leading lead ore is the sulphide known as galena. The common ores of zinc are the sulphide, called sphalerite or jack, the chloride, and silicate.

The zinc ore of Galena, as well as much of the ore from Missouri, is smelted in Kansas. This work was formerly done at Weir City, Pittsburg, and Girard, on account of the cheap coal fuel near those places. With the opening of the gas-fields further west and the great convenience and cheapness of this fuel, these smelters were removed to Iola, and new smelters were erected at Cherryvale, Chanute, and Neodesha. To-day over half of the metallic zinc of the United States comes from these Kansas smelters. In the Iola region alone there are nine smelters, with 30,000 retorts, giving a daily capacity of 350 tons of metallic zinc or spelter, requiring over 700 tons of ore. At Cherryvale is the largest zinc smelter in the United Statos, containing over 4000 retorts, owned by the Edgar Zinc Company, of St. Louis. At Gas City, east of Iola, the Lanyon Zinc Company has a large zinc rolling-mill. The only other places in this country where such mills are found are at La Salle and Peru, Ill. Two of the smelters at Pittsburg, using coal fuel, were refired this year.

The process of smelting zinc is divided into two parts, consisting, first, of roasting, to drive off the sulphur, which amounts to about thirty per cent. in the original ore; and second, of reducing the ore to a metallic state. The ore is transported to the smelters from the various mining regions of Joplin and Webb City, Mo., and Aurora and Galena, Kan., and is passed between heavy rollers to grind it to a sand. It is then raised to the second floor and passes into the roasting furnace, which has three floors, one above the other. The material on the upper floor is heated to a moderate degree for a number of hours and then is dropped to the second floor, where the heat is greater, and finally dropped to the lower floor, where a white heat is maintained. The material at the end of the operation contains about one per cent. of sulphur, and the time for the complete operation is about twenty-four hours. The greater portion of the sulphur passes out through the vapor stacks. The effect of this sulphur gas is seen for considerable distance around the works in the barren waste of ground, where the vegetation is killed.

From the roasting furnace the ore is taken to the mixing rooms, where crushed coke is added in the proportion of about one to one, and enough water to make the mixture adhere together. This mixture is hauled in high iron cars to the retorts, which are cylinders of fire-clay four feet long and eight inches in diameter, closed at one end. These fit in openings in the sides of the furnace, with the open end flush with the furnace wall. The fires are started, and the retorts are heated slowly, so as not to crack them, and when heated to whiteness, the ore and coke are packed in, and a condenser, a conical vessel made of fire-clay, about twelve inches long and six inches in diameter at the larger and two inches at the smaller end, is placed with the larger end just entering the open end of the retort. As the ore is heated the zinc is driven off as heavy vapor, which forms in drops on the inside of the condenser, from which the metal is tapped, in long ladles, about three times in twenty-four hours. The molten metal is emptied into a traveling kettle and poured into molds about 9 x 19 x 1¼ inches, making a fifty-pound plate, known as "spelter." The retorts are cleaned out with water or steam blast, and the so-called residue is used to a considerable extent for railroad ballast, as it sets in a cement.

CHEMICAL INDUSTRIES IN KANSAS.

An unwritten chapter in the discussion of the mineral industries of Kansas is the discussion of the chemical works in the state. This is an important feature in the state's mineral resources, although the number of plants is small, there being in all three, and one of these idle at the present time.

Blue Vitriol.—The only plant in the United States manufacturing blue vitriol by itself, and not as a by-product in other work, is located at Argentine, the property of the Southwest Chemical Company. On account of the closing down of the Argentine smelter this plant is also idle, but it is hoped that this closing of a very valuable industry is only temporary.

Sulphuric-acid Manufacture.—The plant of the United Zinc and Chemical Company is located on the bank of the Kansas river, about one and one-half miles southwest of the Argentine railroad station. This plant was started some years ago to make sulphuric acid, and has been enlarged from time to time until it is a factor in the sulphuric-acid manufacture of the West. Nitric and hydrochloric acids are also made.

The method used in the manufacture of the sulphuric acid is practically the same as in the various other works in this country, with certain improvements in machinery and manipulation designed by the able chemist of the company, Mr. Ottokar Hofmann.

The United Zinc and Chemical Company now owns the new plant at Iola, known at the

Standard Acid Company.—At Iola there has recently been constructed a sulphuric-acid plant, using the natural gas for fuel. This has been constructed under the direction of Mr. E. Nesbitt and Mr. Otto Proelss. The zinc ore is roasted in a mechanical continuous roaster, made up of a seven-row muffle kiln, capable of roasting ore enough for a three-block, 1728-retort zinc smelter, or forty-five tons a day. The sulphur fumes pass into a flue, where some of the dust is deposited, and the sulphur then passes to a square condensing tower, forty-nine feet high, and the heat it carries is used to concentrate some of the weaker acid. The sulphur gas is then carried through a three-foot pipe into six chambers, connected tandem, one behind the other. Steam is admitted into these, and condensation takes place. From the last chamber another lead flue carries the gas to the absorbing tower, and then downward into a second absorbing tower; both of these recover as many of the nitrogen compounds as possible. These compounds were added in the condensing tower in the form of nitric acid (HNO_3) to give oxygen needed. These absorbing towers are lined with lead, and are filled with a checkerwork of bricks, which are chemically free from lime, iron, and alkalies. Four hundred tons of lead were used in the construction of this plant, and the daily capacity is about fifty tons. The finished product is pumped into storage tanks, and from these runs by gravity into tank-cars of 65,000 pounds' capacity. The buildings are frame, and cover twenty acres of ground. The main building is 526 feet long, 65 feet wide, 70 feet high, with an L 111 feet long. The sulphuric acid is used for the manufacture of fertilizer, for refining petroleum, manufacture of nitro-glycerine, alum, soda, ash, ammonium sulphate, and blue vitriol.

Mineral Waters.—Kansas is well supplied with springs of mineral water, a number of which are of more than local renown. There are over 100 of these springs in the state which have attracted more or less attention. Analyses show that these waters compare favorably in quantity of constituents and in variety with waters of the same class found elsewhere. One of the largest of these springs is the Waconda or Great Spirit spring, located in the central part of the state. It is situated on a mound, and is thirty-five feet in depth and fifty-six feet across. Its waters belong to the chlor-sulphate group. The spring from which the most water is shipped to other points is the famous Abilena, near Abilene. The water is obtained from a number of wells, and was discovered in 1897, and three years later the property was purchased by the present Abilena company. The water is a natural cathartic and holds a high reputation among the chemists and physicians of the West.

Zinc Reduction Furnace Block.

Zinc Reduction Works at Iola.

Zinc Smelter at Neodesha

This water is to be found at all the fountains on the St. Louis Fair grounds. Space will not permit a description of the other noted Kansas mineral springs, but volume VII of the University Geological Survey gives a complete account of these springs, with analyses of their waters.

GLASS INDUSTRY.

For a number of years the glass industry of this country has centered in the gas belts of Indiana, Ohio, and Pennsylvania, and in the year 1902 this industry was started in the gas belt of Kansas. This state has at the present time a large reserve supply of gas fuel, and in the oil development many new gas-wells are being opened, often to the great disappointment of the oil prospector. The trouble in many of these sections of the state is a lack of demand for the gas, as a gas-well without any means of utilizing the supply is not a money-making proposition. People in the East interested in glass propositions fail to appreciate the opportunities before them in this section. Glass-sand is found in the gas belt in large quantity and of high degree of purity, good limestone is found here, and the salt-cake is manufactured in the state. Here are the necessary elements for the glass mixture and an abundant supply of cheap fuel in the form of gas. There are excellent railroad facilities for transporting the supply to the markets. If gas gives out at a future day the coal-fields are but a short distance away; so the fuel question is solved for the future.

There are in the United States 109 window-glass factories, with a total of 2900 pots, which, if worked at their full capacity, could produce 250,000 boxes of fifty feet weekly. At Coffeyville, Kan., there are three window-glass factories. The Kansas Glass Company has a twelve-pot furnace, with a daily capacity of 9600 feet, and was built at a cost of $40,000. The Coffeyville Window Glass Company is the largest one in the state, and has a thirty-six-blower tank and makes a car-load of glass daily. The Sunflower Window Glass Company is building a twenty-four-blower tank plant. The Marion Fruit Jar Company has secured ground for a large plant at Coffeyville which will have a daily capacity of five car-loads of jars. The Coffeyville Bottle Company is engaged in the manufacture of prescription bottles. The Pioneer Flint Glass Company, of Coffeyville, will make a specialty of tableware.

At Independence is located the window-glass factory of the Midland Glass Company, which started work in November, 1902. This is a twelve-pot furnace, with a capacity of 165 fifty-foot boxes of glass daily. At Cherryvale, the Cherryvale Glass Company has a six-pot circular furnace, with a daily capacity of 600 dozen pieces. The company makes a specialty of tumblers and glasses for table and bar use.

TWENTY YEARS OF PROGRESS.

VALUE OF OUTPUT.

Products.	*1883.*	*1903.*
COAL	$1,152,000	$9,875,250
ZINC	816,306	9,464,562
CLAY	....	1,215,275
SALT	....	1,145,869
PORTLAND CEMENT	....	1,125,000
OIL	....	1,120,018
NATURAL GAS	....	1,115,375
STONE	145,000	525,000
GYPSUM	....	375,000
LEAD	420,000	193,256
COKE	....	175,000
SAND	....	100,000
NATURAL CEMENT	....	75,000
LIME	....	75,000
TOTALS	$2,533,306	$26,579,605

MANUFACTURES

KANSAS, with a population of 107,000 in 1860, had grown to 996,096 in 1880, and at the present time is nearly 1,500,000. With this increase of population there has been an increase in manufacturing establishments which well deserves attention. From 314 factories in 1860, the number had grown to 2803 in 1880, and to 7830 in 1900. This represents an increase of nearly 60 per cent. from 1880 to 1890, and during the period from 1890 to 1900 an increase of 75 per cent. The value of products made in Kansas mills and factories has increased from $4,357,408, in 1860, to $30,843,777, in 1880, to $172,129,398, in 1900. Of these manufacturing industries, almost two-thirds of the product is made from the agricultural resources of the state. Among the manufacturing states of the Union, Kansas ranks twenty-ninth in capital invested, twenty-eighth in number of wage-earners, twenty-fifth in output of products.

Twelve per cent. of the wage-earners of Kansas are engaged in manufacturing lines, represented by 56,600 workers, to be contrasted with 56.6 per cent. depending directly on agriculture. The manufacturing interests of Kansas are moving forward, and the capital invested in such work has increased 52 per cent. during the decade to 1900.

Meat-packing represents the leading one of these industries of the state, and centers especially in Kansas City, which is the second largest meat-packing city in the country, with the largest single packing-house in the world, having a total of ninety acres of floor space.

The value of these products has increased 73 per cent. in the last ten years, and their value represents 44 per cent. of the total value of all the manufacturing products of the state.

Flouring- and grist-mill products hold second rank among the Kansas manufacturing products, there being 533 mills, an increase of fifty-three per cent. in ten years. During this period the value of the products has increased twenty-five per cent. This industry started at Atchison in 1861 with the building of the Pomeroy flour-mill. The output of all these mills does not compare with the state's production of grain. Of the crop of wheat harvested in the state in 1900, only 24 per cent. was ground in the Kansas mills.

Railway equipment, repairs and construction are made in thirty-seven shops, and the value of such products in the last ten years shows an increase of 87 per cent., making this the third manufacturing industry of the state, and among the states of the Union ranks tenth.

Zinc smelting is an industry in which Kansas leads, holding first rank among the states. This high place is due to the valuable fuel deposits of southeastern Kansas. No industry in the state shows the record of increase in the last ten years approaching this line of manufacture. The capital invested in zinc-smelting plants in that time represents an increase of 2293 per cent., and the value of products manufactured shows an increase of 480 per cent. This industry centers in Iola, Cherryvale, Neodesha, Chanute, Altoona, and Pittsburg.

Minor but important industries are found in the foundries and machine-shops, ninety-four in number, making in 1900 nearly $3,000,000 in products.

There are in the state 470 saddlery and harness establishments whose products amount to $1,500,000. Creameries have flourished during the last ten years, increasing 69 per cent., giving a total of 171 plants manufacturing cheese and butter, worth, in 1900, $3,652,530, an increase of 290 per cent. in ten years, giving the state tenth rank. Soap and candles are made in seven factories, whose annual production is over $1,000,000, an increase of 500 per cent. in ten years.

Of the 105 counties in Kansas, twenty-seven have over 100 manufacturing plants to the county, and only two fail to report any manufacturing industry. There is a wide variety of products made in the state, numbering 140, from A to Z. Thirty-six cities have 45.2 per cent. of the plants, leaving the larger per cent. in smaller cities and towns. Of this forty-five per cent., one-third is found in three cities — Kansas City, Topeka, and Wichita. Of the products made in these various factories, 56.6 per cent. is sent out from the factories in these three cities.

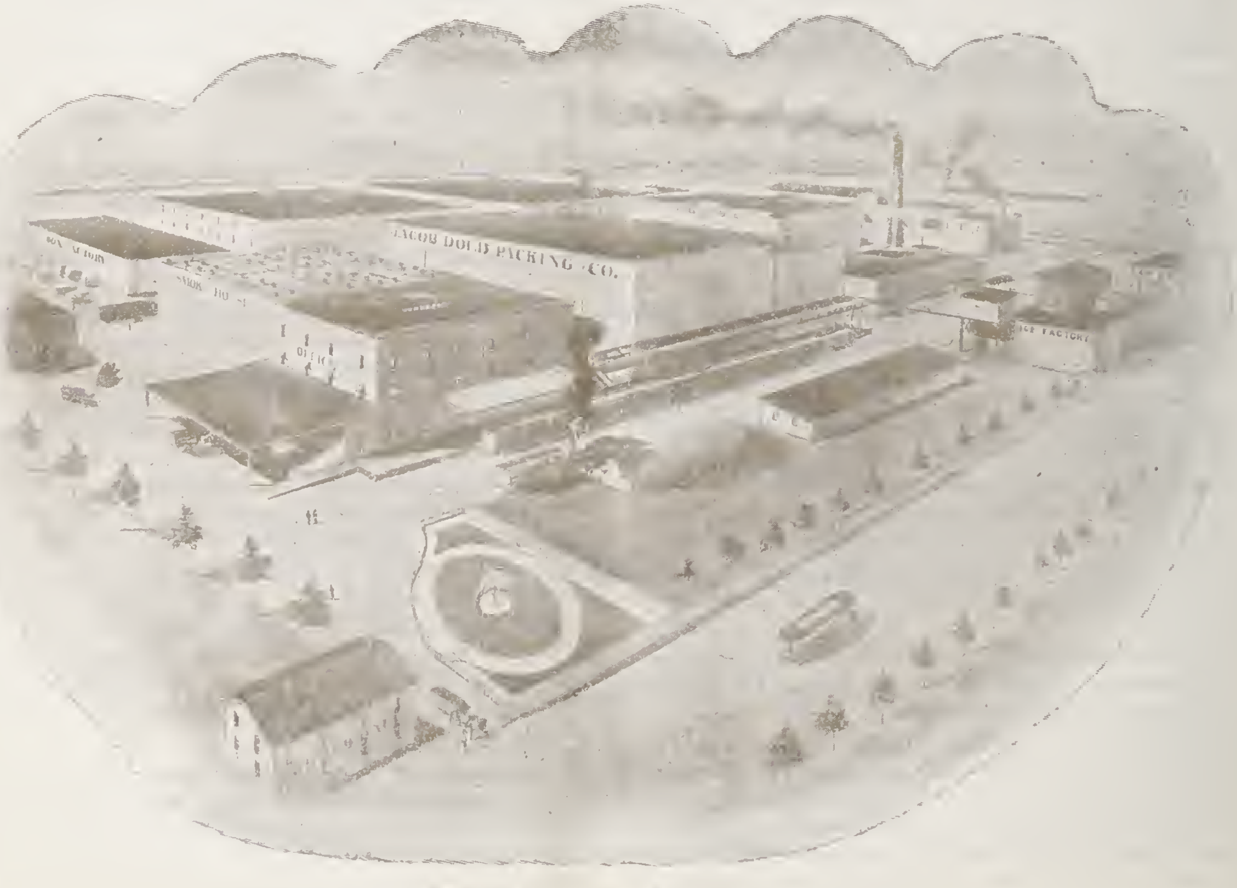
Kansas City holds first rank among the manufacturing cities of Kansas, with 492 plants, whose annual output is $82,768,943, an increase of 87.8 per cent. from 1890 to 1900, and representing forty-eight per cent. of the total output of the state. Sixty-one varieties of manufacturing industries are located in this city, the leading ones being meat-packing, soap and candles, foundries and machine-shops, flour-mills. The largest hard-wheat flour-mill in the world is the Rex mill, at Kansas City, which has a daily capacity of 5000 barrels, and storage capacity for 250,000 bushels of wheat, and the output is 1,200,000 barrels a year, a large part of which is shipped to Europe and South Africa. The new mill was built in 1896, and is a fire-proof structure six stories high, with a storeroom holding 75,000 bags of flour, and 150 men are employed.

The city, with a population of over 50,000, ranks seventeenth among the manufacturing cities of the country. No city of its size equals it in manufactures. There are six foundries and machine-shops, employing 290 persons, who receive in yearly wages $225,000. There are seven flour-mills, whose annual output equals $525,000. The five meat-packing plants employ nearly 8000 persons, with an output of $75,000,000. There are three soap and candle factories, making $1,000,000 worth of products.

Topeka holds second rank, with 400 plants, whose annual products amount to $17,371,654. These plants employ about 6000 persons, and the wages paid amount to nearly $4,000,000. In the ten years from 1890 to 1900 the output from these factories showed an increase of 47.8 per cent., and they yield 5.8 per cent. of the total output of the state.

This city is the leading flour-milling city of the state, and has twelve mills, whose annual output amounts to $3,787,460. In flour alone these mills sent out last year 900,000 barrels. The Santa Fe railroad shops have cost about $1,000,000, and were established in 1869. They employ about 2000 men, who received last year over $1,000,000 in wages, and the value of the output was $2,500,000.

There are two mattress factories, making 28,000 mattresses, 2000 couches and 20,000 bed springs each year. Topeka has nine foundries and machine-shops, employing 136 men, and an annual output of $300,000. The largest creamery in America is the Continental Creamery, established at Topeka in 1900, which receives cream from 350 stations. The daily capacity is 75,000 pounds, and last year they made 1,500,000 pounds of butter, which with other products amounted to $1,600,000. The Jensen Manufacturing Company manufactures special creamery apparatus, and last



A Packing-house Plant at Wichita

A Group of Industries at Atchison

A Flour Mill at Kansas City, Kan.

year made over 350 pasteurizers and cream-ripeners, The Currie Windmill Company has a well-equipped plant for manufacture of steel windmills, steel towers, and grinders. This city has twenty-eight printing and publishing houses, employing 645 persons, with an annual business of a little less than $1,000,000. The two woolen-mills employ 270 persons, with annual sales of over $200,000. The Wolff Packing Company employs 200 men, and last year killed nearly 130,000 hogs and over 8000 cattle. The annual output amounted to $2,000,000. The Kuehne Pickle Factory employs 100 persons, and the annual sales amount to $100,000. Among the new industries are the automobile and bridge factories.

Wichita holds third rank as a manufacturing city, with 328 plants, whose annual production amounts to $10,812,694. There are sixty-two varieties of factories, which employ 2065 hands, who receive in wages $897,192. The capital invested in these industries is nearly $3,000,000, and last year these factories used over $7,000,000 of new material.

The Union Stock-yards receive over 6000 cars of stock a year. The Jacob Dold Packing Company plant was rebuilt in 1902, at a cost of $500,000, and has a daily killing capacity of 3000 hogs, 1000 cattle, 1500 sheep. This plant is equipped with electrical power, and contains over twenty-five acres of floor space. It employs 350 hands, with an annual pay-roll of $160,000, and has a cold-storage plant holding 20,000,000 pounds of meat. Its products are shipped in all directions. The John Cudahy Company plant has nearly same capacity, with an annual pay-roll of $175,000.

One of the large Western cracker factories, owned by the Bryan brothers, is located at Wichita. This plant, established in 1880, employs 225 persons, and the annual sales amount to $250,000. The vinegar works, with an annual pay-roll of $12,000, sells $60,000 of products annually.

The Hays Leather Company, established in 1874, has an annual output of $250,000, ranking among the first establishments of the kind in the West. The McComb Brothers Harness Company is another growing institution, with yearly sales of $90,000. The Pioneer Shirt Company makes 1200 shirts each week, and has a weekly pay-roll of $300. The United Sash and Door Company employs 150 men, with an output of $500,000, and is one of the largest plants west of the Mississippi. The Wichita planing-mill is another of the large mills of the state. One of the largest machine-shops of the state is the Wichita Bridge and Iron Works, with a pay-roll of $4000 a month. The second largest stove factory in the state is the Wichita Stove Works, whose yearly sales amount to $60,000. The only factory in the state making farm wire fencing and portable corn-cribs is the Arkansas Valley Fence Company, of Wichita. The American Soda and Baking-powder Company manufactures $35,000 worth of goods a year. The Western Furniture Company operates mattress, furniture and couch factories which cover two acres of ground. One of the large Western casket factories is that of the Wichita Casket Company. Nearly 1,500,000 cigars are annually made in Wichita. The Yucca Soap Company has annual sales of nearly $100,000. The Wichita Ice Company manufactures forty tons of ice daily. The candy factories have annual sales of nearly $130,000.

A Packing-house Plant at Topeka.

Vitrified Brick Plant at Topeka.

Water Power at Neodesha.

Glass Works at Independence.

The output from the printing and publishing houses last year was $271,000. The flour-mills output amounts to $1,500,000.

Wichita is near the center of the wheat belt of Kansas, and with its excellent railroad facilities and large number of jobbing houses exerts a marked influence over the Southwestern country.

Leavenworth is the oldest city in Kansas, being settled in 1854, and it ranks fourth in manufacturing industries. There are 220 establishments, manufacturing about $3,000,000 of products, or 2.7 per cent. of all in the state. There are fifty-five varieties of plants, of which the most prominent are the foundries, stove works, mill machinery, and furniture. The Missouri Valley Bridge and Iron Works does an annual business of $1,000,000.

The Great Western Manufacturing Company was established in 1858 and incorporated in 1886. It manufactures flouring-mill, grain-elevator, power-transmission, elevating and conveying machinery. It also makes a specialty of the equipment of plaster mills, cement mills, and does a general line of foundry work. It employs 250 men, and markets its products west of the Mississippi river. The buildings of the company cover two city blocks, and it is the largest plant in this Western country devoted to the manufacture of flour-mill machinery. The volume of the business amounts to $700,000 a year. The Great Western Stove Company, established in 1866, manufactures the well-known line of Banquet heating and cooking stoves, and it is one of the largest stove factories in the West. It employs 300 men, and manufactures 45,000 stoves a year, using 3000 tons of pig-iron. The plant covers one block, and the buildings are mostly four stories high.

Furniture factories were established in Leavenworth in 1884, and manufacture dining-room, bedroom and kitchen furniture. The Klemp Table Factory uses yearly 143 carloads of lumber, making several thousand pieces. The Abernathy Furniture Company employs 150 men. The Helmers Manufacturing Company makes a variety of cheaper grades of furniture as well as the better grades, and has warehouses of 100,000 square feet of floor space.

The Kelley Broom Factory is one of the largest in the state, with a daily capacity of 150 dozen. There are in the city fifteen cigar factories.

Among the flour-mills are the Acme, which makes a specialty of corn-meal, turning out 100 barrels a day. The Kelley & Lysle Milling Company has a daily capacity of 1000 barrels of flour, and uses annually 1,250,000 bushels of wheat. The Globe Canning Company has an annual output of 60,000 cases of twenty-four cans each. The Thudium Packing Company, at Leavenworth, kills about thirty-five beeves and 300 hogs each week.

Atchison is the fifth city in manufactures in the state, and has 111 establishments, sending out annually products amounting to about $3,000,000, or 1.5 per cent. of the total of the state. Among the large plants is the John Seaton Foundry, established in 1872. The works cover an area of 700 by 400 feet, and the company employs about 200 men. This is the largest foundry in the state, and its special features of work are large castings, railroad castings, and stoves, builders' ironwork, iron stairs. The annual output is about $250,000.

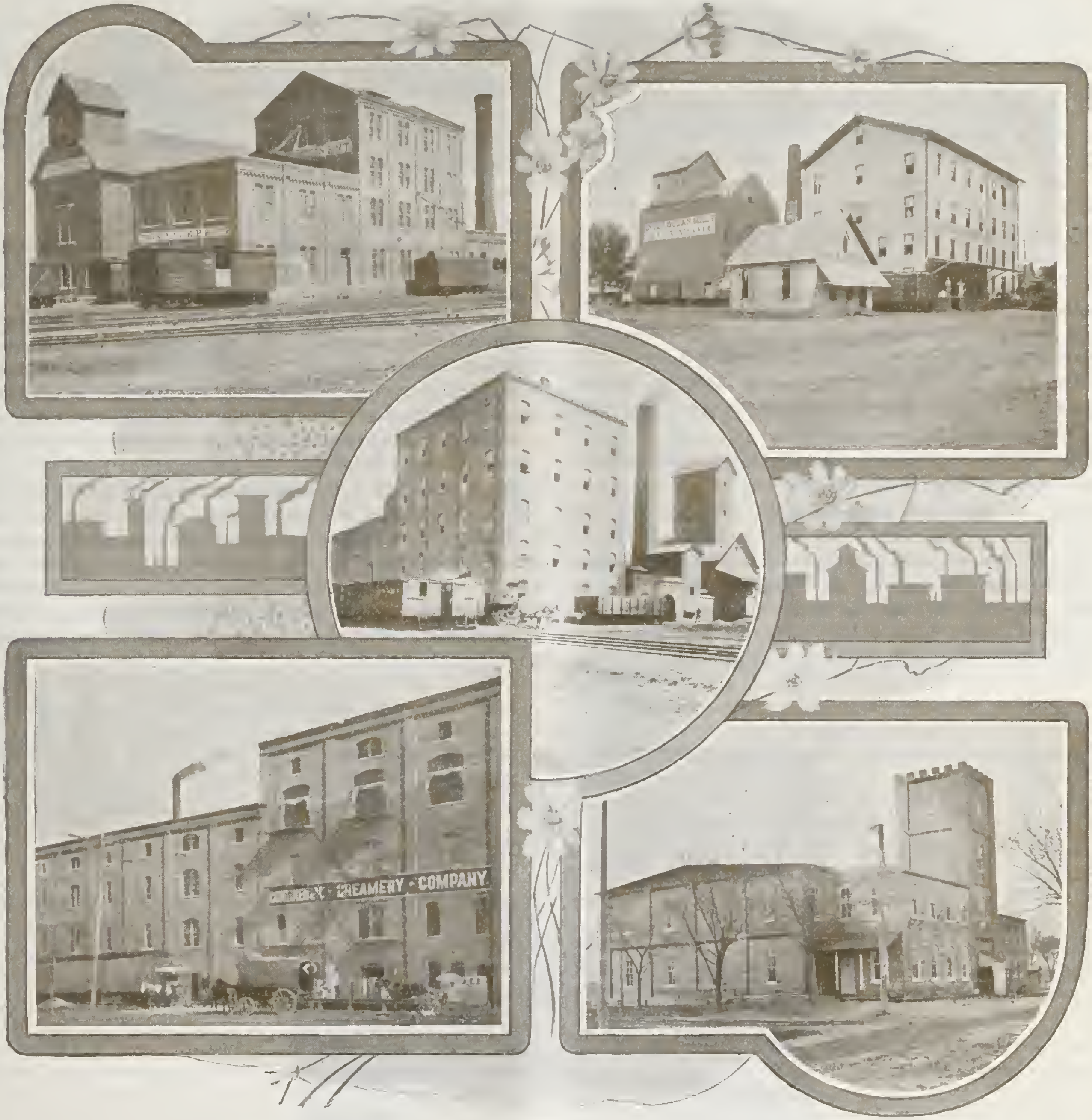
The home office of the Carlisle-Penwell Lumber Company is at Atchison, and in its various mills over the country 6000 men are employed. The Howard Manufacturing Company is one of the large manufacturers of overalls, shirts, and duck coats, employing 200 people. The Atchison Saddlery Company makes a complete line of harness, saddles, and collars, employing 100 persons. One of the large Western medicine companies is the McPike Drug Company, of Atchison.

A recent addition to the industrial interests of Atchison is the Baker-Vawter Company. It occupies 30,000 square feet of floor space, and employs 100 persons in the manufacture of all kinds of loose-leaf filing and binding devices There are in the city three planing-mills, employing 100 men, a furniture factory, with fifty employees, and an ax-handle factory, with thirty persons employed.

The combined daily capacity of the milling interests is 1650 barrels of flour, 3000 barrels of corn-meal, 200 barrels of oat products—a daily aggregate of mill products which gives an annual output of over 7200 car-loads, or nearly 300 train-loads. Other manufacturing plants in Atchison are the candy factories, broom, heater, canning, sash and door and bottling factories.

Hutchinson is the sixth city in manufacturing industries, and has 140 plants, which send out products amounting in a year to $1,907,370, or 1.1 per cent. of the total. The Shady Grove Creamery Company employs ten persons, and makes each year 725,000 pounds of butter. The Rozell Saddlery Company has annual sales of $65,000. The two large flour-mills at Hutchinson are the Monarch and Kinney, which make 180,000 barrels of flour a year, and employ thirty-seven persons. The Union Ice Company manufactures annually 5250 tons of ice and 5500 tons of salt. There are two cigar companies, which use 10,000 pounds of tobacco annually, and with sales amounting to $10,000. There is one candy factory, employing twenty persons, and with annual sales of $35,000. The great Hutchinson industry is salt, more fully described in the section on mineral industries.

Lawrence is the seventh manufacturing city, and has 128 plants, sending out yearly products amounting to $1,842,199. Among the prominent industries are the Bowersock flour-mill, the canning factory, the Lawrence paper mill, established in 1882, which employs forty-five persons, and makes ten tons of wrapping-paper daily.



A Group of Industries at Topeka.

Pittsburg is the eighth manufacturing city, with 82 plants, whose yearly products amount to $1,616,976. The coal-mines employ about 5000 men, with an annual pay-roll of $3,000,000. Here are located the Kansas City Southern railroad shops, which employ 400 skilled men, with annual pay-roll of $500,000. The Union Iron Works employs 100 men, and makes all kinds of mining machinery, engines, pit cars, railroad castings, and general repair work. The Pittsburg Boiler Works builds all kinds of boilers. There is one large packing-house, which kills annually 36,000 hogs, 12,000 cattle, and 4000 sheep, and employs 75 men. Other Pittsburg industries are the flour-mills, elevators, ice and cold-storage plants, planing-mill, chemical works, cigar factories, carriage works, tannery, marble works, and candy factory.

Salina is the ninth manufacturing city, with 119 plants, sending out yearly products amounting to $1,329,985. The three flour-mills have a daily output of 2500 barrels. There are five wagon and carriage shops, one mattress factory, four candy factories, one roll corrugated machine works, one medicine plant.

Winfield, the tenth manufacturing city, has seventy-five plants, with yearly output of $1,136,346.

Arkansas City, the eleventh manufacturing city, has seventy-four plants, and sends out in products yearly $1,078,555. The city has two flour-mills, with daily output of 1600 barrels of flour and 350 barrels of corn-meal, and employ 100 men. The two ice factories have a daily capacity of sixty tons. There is one packing-house, with daily killing capacity of 150 hogs and 50 beeves. This city has one windmill factory, whose annual sales amount to $12,000. Other industries are the carriage, yeast, broom and cigar factories, and planing-mill.

Coffeyville is the twelfth manufacturing city, with sixty-four plants, and annual output of $1,066,386. Among the prominent industries are the glass-works, described in the mineral section, and the large flour-mills. The paper-mill of the North Star Manufacturing Company is the largest egg-case-filler plant in the country, and has a capacity of thirteen and one-half tons of fillers daily.

Parsons is the thirteenth manufacturing city, with eighty-three plants, sending out yearly $1,025,409.

The other manufacturing cities of the state, according to the census of 1900, have less than $1,000,000 annual output.

This review of the more prominent manufactures and manufacturing cities, with the high per cent. of increase in the last decade, affords a promising outlook for Kansas manufactures. The Western field is large and is growing larger. In Kansas, with her attractive cities, good fuel, and fine transportation facilities, the opportunities for new plants are most excellent. In nearly all of these Kansas cities there exist well-organized commercial or business men's clubs, which are on the outlook for new industries and offer special opportunities for new plants. They have the data arranged to present their advantages, and are always ready to enter into correspondence with interested parties. The manufacturing industries depending on the mineral products of the state are described in the section on mineral resources.

Grain Elevator at Atchison.

TRANSPORTATION

KANSAS has been on the main line of the east and west transportation routes from the days of the pioneer expeditions of Lewis and Clark, and Fremont, to the present era of Pacific coast limiteds. Railroads built across her prairies have opened the treasure vaults of Western mines and the storehouses of Western farms, so that to-day, over the Kansas tracks, passes a commerce garnered from a territory extending from the Missouri to the Pacific, and from the lands of and beyond the sea.

The student of pioneer railroad construction can find a rich field of research in the early history of these Kansas railroads, in the difficulties overcome, in the obstacles removed, in the development of new and sparsely settled lands into prosperous cities and comfortable farming communities.

Kansas, with her 82,000 square miles of territory, is traversed by nearly 10,000 miles of railway, affording an outlet for her various products of soil, mine, and manufacturing plant. Only five counties, and these located in the extreme southwestern part of the state, are without railroads. The state is crossed from east to west by four main trunk lines: Santa Fe, Rock Island, Missouri Pacific, Union Pacific; and from these main lines radiate the various branches and sub-branches, forming a network of transportation lines, which is the property of twelve companies.

These Kansas roads, over their entire lines in the different states, carried, in 1902, 39,452,330 passengers, who paid in fares $48,277,989. They also carried 68,039,812 tons of freight, yielding a revenue of $154,904,182. They possess an equipment of 3582 passenger-cars, 167,320 freight-cars, and 4943 engines.

During the year 1902 the railroad engines in Kansas consumed 4,985,614 tons of bituminous coal. In their repairs and renewal of Kansas tracks, these roads used 92,175 tons of steel rails and 4,738,536 ties. They pay in state taxes each year $1,968,965, and they employ in the state 30,558 men, who receive in wages $16,901,759.94.

Railroad construction began in Kansas in 1860, when the Elwood & Marysville road was graded for twelve miles, and cars ran over about three miles of track, from Elwood to Wathena. This road was abandoned, but after the war the St. Joseph & Grand Island road was built along this same right of way.

Union Pacific was the first permanent Kansas railroad to be constructed. This road was chartered in 1855 as the Leavenworth, Pawnee & Western, and the first mile was graded in June, 1863. In the fall of that year active work began on the construction, and the name was changed to Union Pacific, Eastern Division, and forty miles were graded by the end of the year. When this work began the population of the state was 120,000, and when it was completed the population had increased to 350,000. In 1872 this road, known as the Kansas Pacific, had in the state 672 miles of track, and the annual earnings were about $4,000,000. At the present time the Union Pacific Railway Company, as it has been known since 1880, operates in Kansas nearly 1000 miles of road, including the Leavenworth, Kansas & Western, which was organized under the name of Kansas Central in 1879. The Union Pacific lines are found mainly north of the central line across the state from east to west, and in the eastern part of the state are north of the Kansas river. The road reaches the gypsum-fields of northern and central Kansas and the salt works of central part of the state.

Atchison, Topeka & Santa Fe Railway Company was organized in 1859 under the territorial laws of Kansas as the Atchison & Topeka railroad, to build a road from Atchison to Topeka and to a point on the southern or western boundary of Kansas, in the direction of Santa Fe, N. M. In 1863 the name was changed to the present one, and in 1868 construction work began. The total mileage now operated is 8733, which, with the equipment, has cost $430,554,360 or $54,939 a mile. The total earnings in 1902 were $37,515,117, and the operating expenses were $20,044,203.

This road reaches the salt- and gypsum-fields of central Kansas, the coal-, gas- and oil-fields of southeastern Kansas, and the various manufacturing plants of that section depending on these fuels. The mileage of the road in Kansas includes over 1421 miles of main line, 1774 miles of branches and spurs, or a total of 3196 miles, which is larger than that of any other road in the state—comprising nearly one-third of the total.

The Santa Fe road, through its industrial department, has done valuable work in developing the resources of the state by encouraging the establishment of new industries. The general offices of the road are located at Topeka, and division offices are located at Argentine, Topeka, Ottawa, Chanute, Newton, and Arkansas City.

The main shops were located at Topeka in 1869, when the first mile of track was completed. These are among the most complete railroad shops in the West. Two thousand men are employed here in repair work and new construction of engines and cars. Smaller shops are located at division points.

Railroad Depot at Topeka.

Chicago, Rock Island & Pacific railroad had its origin in 1847, in an act authorizing the construction of eighty-two miles of track, from Rock Island to La Salle, Ill., under the name of the Rock Island & La Salle Railroad Company, with a capital stock of $300,000. In 1851 the charter was amended so as to build the road on to Chicago, by Joliet, under the name of Chicago & Rock Island railroad. The track was built and equipment secured at a cost of $22,000 a mile, and the road was completed in 1854. This was one of the first roads to have Chicago terminals, which were built in 1853, when the city had a population of 17,000. In 1866 this railroad was consolidated with the Chicago, Rock Island & Pacific of Iowa, under the latter name. In January, 1880, trains began running from Chicago to Kansas City.

The Chicago, Kansas & Nebraska Railway Company was chartered in Nebraska and Kansas in 1886, and the work started that year in Kansas. In six months sixty miles of road were built, from St. Joseph toward Topeka. By 1888 this road had built 1089 miles of track, which was sold to the Rock Island company in 1891. In 1900 this system owned 2955 miles of track and had extended south to Fort Worth, through Oklahoma and Indian Territory The company at the present time operates, in main lines, branches, and sidings, 8057 miles of track, which, with equipment, has cost $116,242,261. In 1862 the Rock Island company had 1132 employees and 59 engines. In 1884 it had 9000 employees, 309 engines; in 1902, 15,000 employees, 661 engines, 18,828 cars. This company also owns the Choctaw, Oklahoma & Gulf railroad, organized in 1894, which has 14.68 miles of track, from the Oklahoma line to Anthony. In Kansas the Rock Island road has 1313 miles of track, being third in amount of track operated in the state. It pays in the state $2,526,543 a year in salaries, to 3978 employees. The gross earnings of the entire road in 1902 were $28,683,824, and the operating expenses were $17,813,238. It moved 8,361,238 tons of freight and carried 8,315,325 passengers, over the entire system.

The Rock Island road in Kansas reaches salt- and gypsum-fields of the central part of the state, the manufacturing plants from Kansas City to the west and southwest, and the northeastern part of the state.

Missouri Pacific Railway Company was organized under the laws of Missouri in 1876, and purchased the Pacific railroad, which was first incorporated in Missouri in 1849. The road was enlarged by consolidation in 1880 and 1881, and was consolidated with the Missouri Pacific of Nebraska in 1882. This company operates 3464 miles of road, of which 2716.9 miles are in Kansas. In this state the company employs 9041 persons, paying in salaries $3,963,103. The earnings of the whole system in 1902 were $19,781,335, and the operating expenses were $14,242,575. It carried 3,433,009 passengers and 8,306,286 tons of freight.

The Missouri Pacific road reaches the coal, oil and gas districts of eastern and southeastern Kansas, and the various manufacturing industries depending on these fuels; also the salt and gypsum deposits of central Kansas. This road maintains an industrial department, engaged in aiding in the promotion and establishment of new industries, and has been the means of establishing some important plants in the state. This road ranks second in the mileage operated in this state.

Missouri, Kansas & Texas railroad was organized in 1870. Its construction work began under the name of Union Pacific Railroad, Southern Branch, chartered in 1865. Work began in 1869 at Junction City, and the road entered the Indian Territory in 1870. This company was reorganized in 1891. In 1872 it had an equipment of forty-one engines, 1350 freight-cars, and 36 passenger-cars. In 1902 the equipment consisted of 330 engines, 11,586 freight-cars, 226 passenger-cars. The company operates 2554 miles of road, of which 488.9 miles are in Kansas. It employs 1582 persons in Kansas, paying $1,126,172 in wages.

St. Louis & San Francisco Railroad Company was organized in 1876, and reorganized in 1896. In 1901 this road was consolidated with the Kansas City, Fort Scott & Memphis, which had been organized in 1888, and now operates 827 miles in Kansas. It employs in the state 1526 persons, who receive in wages $1,047,601. The tracks of this company are found especially in eastern part of the state, with a line reaching out into central Kansas. The road reaches the coal, lead and zinc deposits of eastern Kansas.

Kansas City Southern railroad was organized in 1900, under the laws of Missouri, to succeed the Kansas City, Pittsburg & Gulf, and operates 833 miles of road, of which 40.4 miles are in Kansas. The road employs in the state 616 men, receiving $302,030 in wages.

Burlington railroad was organized in Illinois in 1855, succeeding the Aurora Branch road, chartered in 1849. In 1880 the Burlington & Missouri River Railroad of Nebraska was consolidated with the Burlington of Illinois. This road operates in Kansas, from the Nebraska line, roads to Atchison, Oberlin, St. Francis, and Concordia—a total of 259 miles.

Chicago Great Western railroad was organized under the laws of Illinois in 1892. It owns no road in Kansas, but runs trains over 32.9 miles of leased track, from Kansas City to Leavenworth.

St. Joseph & Grand Island railroad, organized under the laws of Kansas and Nebraska in 1897, operates 138 miles of track, from St. Joseph, Mo., to the Nebraska state line near Hollenberg.

Leavenworth & Topeka railroad, operated at the present time by the Santa Fe, was incorporated in 1899, and has fifty-six miles of track, from Leavenworth to Topeka.

Kansas City, Mexico & Orient railroad was organized in 1900, to run from Kansas City diagonally across Kansas and on to the Pacific ocean, in Mexico. The road is now under construction.

Express Companies.—The Adams Express Company operates in Kansas over about 532 miles, over the Burlington and 'Frisco roads. It has seventy-eight offices in the state. The American Express Company operates only over the M. K. & T. road, and has forty-seven offices in the state. The Pacific Express Company operates over the Missouri Pacific and Union Pacific roads in this state. Wells, Fargo & Company operate over 3289 miles in Kansas, over the Santa Fe, Great Western, Kansas City Southern, St. Joseph & Grand Island, and 'Frisco.

Street-railway mileage in Kansas amounts to 195.8, and represents an invested capital of $6,027,000.

A Trans-continental Train passing through Kansas.

EDUCATION

By ARVIN S. OLIN,
LAWRENCE.

THE educational organization of a community is at the same time the exponent of its intellectual and moral life, and that which gives form and tone to that life. It is both the cause and the effect of what is best in its intellectual development. This truth has exceptions—both ways: people who achieve eminence in spite of meager and faulty educational facilities, and others who sink below mediocrity in spite of the best equipment and the most liberal opportunities. But, on the average, what a people become will be determined by the forms of their education and the spirit back of these forms; and their culture and intellectual development will in turn react on and modify the educational forms that they use.

So it has been in Kansas; this state, which now has a larger percentage of her population enrolled in schools of various grades than any other state, very early gave her attention to the problems of education, with the result that she now stands among the best states in the intelligence of her citizenship and the low rate of her illiteracy. The earliest settlers brought this spirit with them. The New England Emigrant Aid Company sent into the new territory something more than men who should work and vote to make Kansas a free state: they also sent the desire for learning and the spirit of free schools; the force that had impelled Harvard and Dunster and Cheever and Mary Lyon and Horace Mann. One needs to make scarcely any allowance for poetic license in understanding the words of Whittier, in his "Song of the Kansas Emigrants":

"We cross the prairies as of old
Our fathers crossed the sea,
To make the West as they the East
The homestead of the free.

"We go to rear a wall of men
On Freedom's southern line,
And plant beside the cotton-tree
The rugged northern pine.

* * * * * * * *

"We go to plant her common schools
On distant prairie swells,
And give the Sabbaths of the wild
The music of her bells!"

* * * * * * * *

Although this spirit came in strongly with the settlers from Eastern states, here and there schools had been established even before Kansas was erected into a territory. It is claimed that the first school established in Kansas was opened by Rev. John Armstrong, in Wyandotte, July 1, 1844. The school was for Indians, but it was also attended by the few white children of the community.

It may be that this school was somewhat antedated by one established in Doniphan county, near the present site of Highland. This was in connection with the Presbyterian mission to the Sac and Iowa Indians, in charge of Rev. S. M. Irwin. This school is the educational nucleus from which Highland University was developed some years later.

There is mention of one other school in these preterritorial days—a Methodist mission school, established at Council Grove, by T. S. Huffaker, in 1850.

These schools were for the special purpose of aiding in civilizing and Christianizing the Indians, but they "set the pace," and made it easier to inaugurate and carry out other educational movements.

When the Kansas-Nebraska bill became a law, and the tide of immigration began to set in strongly, the necessity of a systematic and comprehensive plan for educating the youth of the new territory at once became evident, but it was a considerable time before laws could be enacted providing for the public support and control of schools, and in many localities private or community enterprise outran legislative action, and schools were in successful operation before the first school law was passed, in 1855, fourteen months after the organization of Kansas territory.

This law provided for the establishment of common schools, open to white children from five to twenty-one years of age. Three years later, when free-state influence had become dominant, the distinction as to color was eliminated from this provision. The legislature of 1858 also for the first time provided for a territorial superintendent of schools.

Not only in the laws was education fostered, but in the numerous constitutions that were framed and offered to the people as the sailing chart for the new craft when it should launch upon statehood, were many liberal provisions and guaranties of educational progress. The Topeka constitution, framed in 1855, provided for a permanent school fund, a system of common schools, university, and normal schools. The Lecompton constitution, framed in November, 1857, provided for the care and proper use of the school fund and for the establishment of at least one common school in each township. The Leavenworth constitution, prepared in March, 1858, contained provisions for a common-school system, the care of school funds, for normal, preparatory, collegiate and university instruction, for state and county superintendents, and a commissioner of school funds.

The Wyandotte constitution, which was adopted by the people and approved by Congress for the basis of government for the new state, provides for the present educational system of the state, establishing the state and county superintendency, safeguarding the permanent school fund and making provision for distributing the income derived from it, and ordaining the establishment of "common schools and schools of higher grade, embracing normal, preparatory, collegiate and university departments."

As has been said before, the people did not wait on legislature or constitutional convention to begin Kansas educational work, and a few of the more important beginnings are here noted,

Lawrence was the center of free-state influence in Kansas, and here, January 16, 1855, E. P. Fitch opened a school. A collection was taken among the citizens to defray all the expenses of the school, which was then made free to all. There may have been schools opened before, but this was one of the first in the new territory.

In September, 1856, the conference of Kansas and Nebraska of the Methodist Episcopal church organized the Kansas Educational Association, in the interest of higher Christian education; the result of this was the establishment, a year later, of Baker University, which, under the presidency of Dr. Werter R. Davis, opened its doors to students in 1858.

In May, 1857, was opened the school which, a year later, received a charter as Highland University. These two institutions, Baker and Highland, with their long and honorable careers, stand as the pioneers in the field of higher education in Kansas.

In November, 1857, Mr. C. L. Edwards opened the Quincy high school in Lawrence. The school was named for Hon. Josiah Quincy, of Boston, and was well patronized from the beginning. In 1856 a meeting had been held in Lawrence to make the beginnings toward the founding of a university; a board of trustees, including Gov. John W. Geary, Gov. Charles Robinson, I. T. Goodnow, and S. C. Pomeroy, was appointed. But the enterprise was subject to many checks and hindrances. The promoters of the institution were disappointed regarding funds they expected from the East, and the embryo university was made over to a board, the majority of whom were Presbyterians, and the high school of Mr. Edwards was adopted as the academic department of Lawrence University, of which Dr. William Bishop was chosen president. The foundation of the old university building, now North College, was put in. But, again, expected funds failed to materialize, and the Presbyterians gave up the enterprise to the Episcopalians, and the academic department, under the direction of Mr. Edwards, became again the city high school.

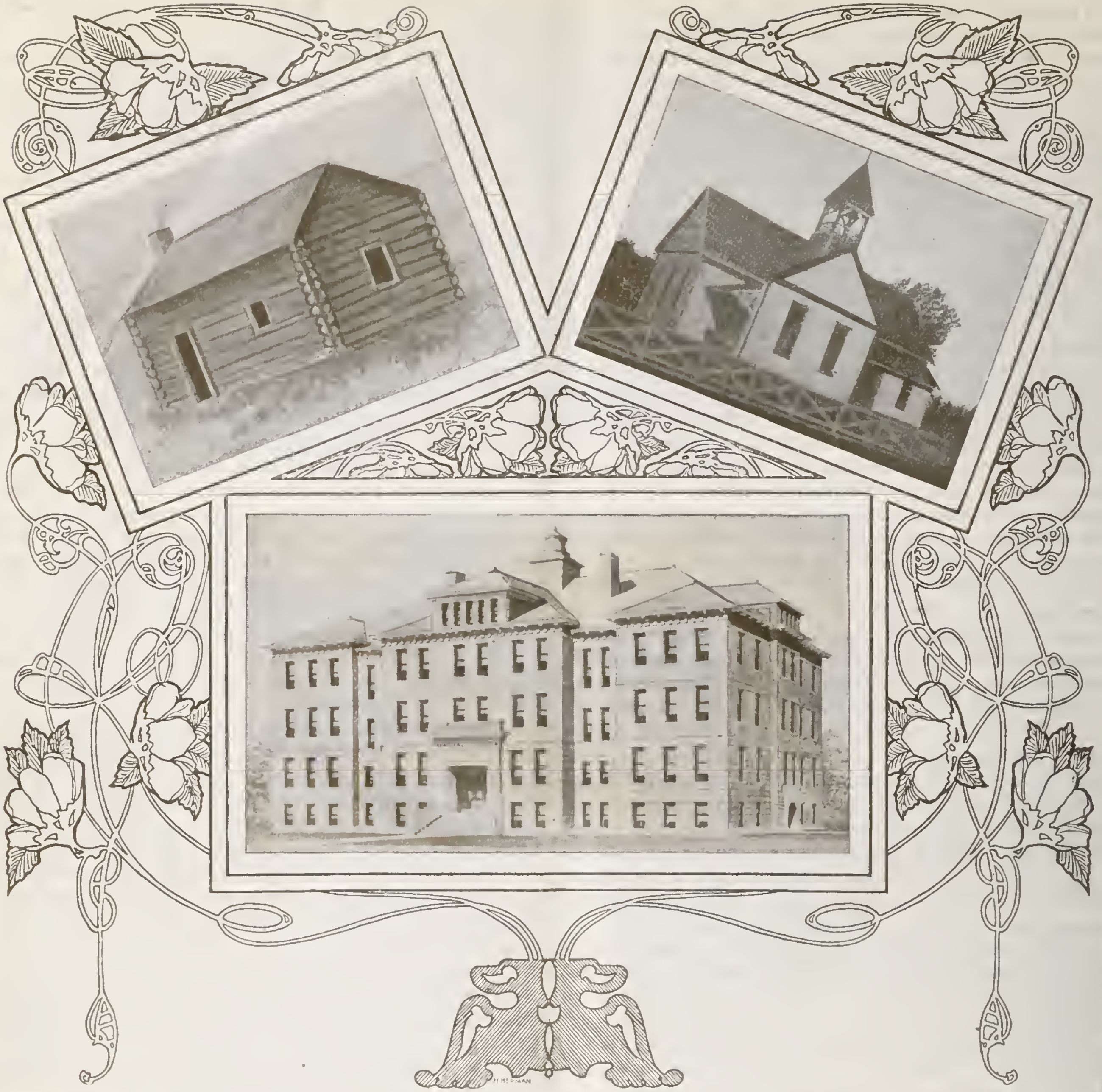
July 3, 1858, the Leavenworth board of education was organized, and July 5 George Wetherell opened the first public school in that city.

There were three territorial superintendents of schools — the first, James H. Noteware, appointed by Governor Geary in February, 1858, and serving until December 1 of that year, when S. W. Greer, who was elected by the people to serve for a term of two years, took the office. Mr. Greer made out reports for the years 1858, 1859, and 1860.

A recent statement from Hon. V. K. Stanley, of Emporia, gives such a vivid picture of educational conditions in early territorial days, that a brief quotation from him is here appended:

"It was in May, 1856, that I commenced my school in Leavenworth county, just one mile south of the village of Springdale, on the bank of Fall creek. I had an enrolment of seventeen scholars, mostly boys, and a very intelligent set of students, all Quaker children but six, who were Missourians, but of the better class of common people. My school was broken up by the border troubles. I boarded around amongst the employers, and received my pay by the scholar. My schoolhouse was a round-pole cabin, with slabs for seats and wooden pegs for legs; three-foot boards on the roof, held on by long poles to weight them down; two small windows, one with two lights, and the other three.

"I kept school five days per week for eight weeks, and the afternoon of the last day there was a man killed and his



EVOLUTION OF THE SCHOOL HOUSE IN KANSAS.

The Pioneer School (1860). The Country District School (1880).

The Modern Manual Training School (1904).

scalp taken to Leavenworth as a trophy, for which a six-dollar pair of boots was exchanged.

"The schools from 1856 to 1858 were subscription schools, as there was no law to govern and no taxes to pay teachers. Schools were opened as soon as the political issues were sufficiently settled to give security to life and home and property, which was not until late in 1858 and early in 1859."

While there was comparatively little else accomplished in territorial days, creditable beginnings were made, and foundations broad and deep were laid in all lines of educational development, and Kansas came to the period of statehood with the common school, the high school, the college and the university ideas outlined on a rational basis, and worthy beginnings made in each of these fields.

Kansas was the storm-petrel of the Union, and the seas beneath her for the five years following her accession to statehood were no less billowy and storm-driven than in the years of her life as a territory. Yet in spite of the excitement, the devastation, and the sorrows of war, and the reaction which followed it, the first decade in the life of the new state saw a marked advance in the social and educational life of the people. The state schools for higher learning and nearly all the denominational colleges in the state were established within this period. As fast as the state was settled, the common school was established and put into immediate operation, and state schools for the blind and the deaf were opened.

In the second decade of the educational development of the state, from 1870 to 1880, there was large and continuous development of educational interests, both extensive and intensive. Perhaps the most striking single events were the reorganization of the State Agricultural College on an industrial basis and the adoption of the present normal-institute system. The most striking feature of educational development in the '80's is the remarkable development of a system of secondary schools, mostly city high schools, with some county high schools and a few academies. The fourth decade of her life as a state Kansas spent in building on foundations already laid. Large developments were made in all parts of the educational system. Colleges and universities assumed the dignity of true learning as never before. High schools increased in numbers and efficiency, and improved their adaptation to the elementary school on the one side and the college on the other. The leaven of the kindergarten entered the primary school, bringing sweetness and light; and nature study helped the child to get a better understanding of the world in which he is placed. Generous provision by the state enlarged the scope of its work for defectives and delinquents, and the nineteenth century closed with the educational system of the state not perfect to be sure, but with every element sound to the core and permeated with the spirit of growth and hopefulness. The most marked feature thus far of the educational growth of the fifth decade of state life, now one-third gone, is the introduction of practical measures for securing to the youth of the state the elements of industrial training.

The various steps and phases of educational growth in Kansas, here sketched so hastily, are such as to inspire respect for the pioneers who laid the foundations, confidence in those who have directed and participated in the state's educational activities, and a steadfast hope for the future, that still higher levels of excellence and efficiency may be reached. It remains to give an account of the educational system as it exists and to show the manner of its administration.

THE PUBLIC SCHOOLS.

Under this caption are included all educational institutions that are required or provided by law and supported at public expense. Of the nearly half-million persons who are being educated in Kansas, more than nine-tenths are being educated in the different kinds of public educational institutions. Classifying these institutions, we have elementary schools, including rural district and city graded schools; secondary schools, including city and county high schools; schools of higher learning, including the University, the Agricultural College, and the Normal School; special state schools: Soldiers' Orphans' Home, Industrial School for Boys, Industrial School for Girls, School for the Blind, School for the Deaf, and School for the Feeble-minded; and county normal institutes.

ELEMENTARY SCHOOLS.

In Kansas, as in most other states of the Union, the common school is that part of the educational system that is regarded as of most fundamental and universal importance, that is most safeguarded by law and constitution, and that demands, where necessary, compulsory attendance on the part of the children of the state. Speaking generally, there is no single purpose for which taxes are levied that receives so high a rate of tax as is levied for the district public school, and no part of the total tax is paid more cheerfully or gives more adequate returns.

The units for the administration of elementary schools are districts, whose boundaries are fixed by the county superintendents of public instruction. Cities of the first and second class are units for educational as for civil administration, while cities of the third class are parts of districts that are administered in the same manner as rural school districts. A city of the third class has a population of from 250 to 2000; a city of the second class, from 2000 to 15,000; and a city of the first class a population of more than 15,000.

In cities of the first and second class the schools are administered by representative bodies, legally called boards of education. These boards are elected at the city elections held in April of each year, for two-year terms, half the entire membership being chosen each year. Usually there are two members for each ward of the city; each ward elects its own members in cities of the second class, but board of education members are elected at large, that is, by all the voters of the city, in cities of the first class. These city boards of education are empowered by law to elect their own officers, including a superintendent of city schools; to make rules and regulations for the government of the schools; to control the school property; to levy taxes for the payment of current school expenses and for the payment of interest and principal of outstanding school bonds; to elect teachers and provide for the examination of teachers; and to establish and maintain a high school.

Schools in cities of the third class and in rural districts are administered by a school board of three members, who are elected by the annual district meeting, one each year, for three-year terms. The district board has the care and control of school property, may employ teachers, and may establish rules and regulations for the school or schools; but it has not the power, as have city boards of education, to levy a tax for school purposes and to fix the length of the school term. These functions are exercised by the annual district meeting, held the third Thursday in June. The annual school-district meeting, with the New England town meeting, is the best illustration of pure democracy now existent in American government. It is empowered by law to elect district officers, determine on a schoolhouse site, levy a tax for current school expenses, and dispose of a schoolhouse site or other property no longer needed. The power to levy tax for the payment of principal and interest on school-district bonds is vested in the board of county commissioners.

The law of the state fixes a minimum curriculum for the elementary schools. This must include orthography, reading, writing, English grammar, geography, arithmetic, history of the United States, history of the state of Kansas, and elements of physiology and hygiene, with special reference to the effects of stimulants and narcotics upon the human system. In the elementary schools of many cities, and frequently in rural district schools, this minimum is exceeded by instruction in physical geography, algebra, civil government, physics, and occasionally Latin or German.

In cities the elementary schools are, without exception, graded. In the smaller towns there are eight classes, one year apart, with promotions from each class to the one above it at the end of the school year. In the larger cities each grade is divided into two classes, making sixteen in all; these are a half-year apart, and there are semiannual promotions. Under this plan, the pupil who, through absence or incapacity or idleness or any other cause, fails to earn promotion with his class, is left a half-year behind them instead of a year, as in the case of annual promotions. A very large number of rural district schools, probably the majority of the total number in the state, have been graded, usually on the eight-class plan, with annual promotions. Nearly or quite all the counties of the state have a system of graduation of the pupils that have completed the common-school course in the district school.

SECONDARY SCHOOLS.

The public secondary schools of Kansas are those that have been organized in accordance with law and are supported with public funds, for the purpose of giving instruction in subjects above the common-school branches and below the rank of collegiate subjects. The secondary schools stand between the elementary schools and the colleges and universities, receiving pupils from the one and preparing students for the other. And yet it should be clearly recognized that the function of preparing students for college is a small part of the work of the Kansas secondary schools. They send out directly into the manifold activities of industrial, social and business life young men and young women equipped with better developed bodies, more mature judgment, better clarified thought, more mental alertness, better classified knowledge, a broader intellectual horizon and a firmer grasp of moral principles than they would have had but for the opportunities afforded by the secondary schools.

The city high schools are controlled by the city boards of education and supported by the city school tax. In a few cases a small tuition fee is charged for the support of the high school. In cities of the third class the high school is controlled by the district school board, and supported from the tax levied by the annual district meeting.

The county high schools of the state, twenty-three in number, have been established under the general laws or in accordance with special acts. They are under the control of boards of trustees, of six members each, chosen by the people of the county, for four-year terms, one from each of the three commissioner districts of the county, to be elected at each biennial election. In managing the school, the board of trustees of the county high school has substantially the same powers as city boards of education have over city high schools, except that the tax for the current expenses of the county high school must be levied by the board of county commissioners, in the same manner as other county taxes.

The courses of study in the city and county high schools include three or four years' work above the eight years' work provided in the elementary schools. The work taken in these schools is approximately as follows: Three years in foreign language, usually Latin; three years in rhetoric and literature; three years in algebra and geometry; two years in history; and two years in the elements of physical and biological science. The high schools in the larger cities offer work in two and sometimes three foreign languages, and more extended courses in English, mathematics, science, and history.

Main Building, State University, Lawrence.

As the resources of the state have increased, high schools have multiplied and increased in efficiency. At present, more than 200 towns in the state are offering partial or complete high-school courses. More than 100 of the best of these are so well equipped and staffed that certificates from the principals that college-admission requirements have been met are accepted by the various colleges and universities in the state in lieu of college-entrance examinations. In many cases these certificates are also accepted by the best colleges and universities in other states.

STATE SCHOOLS OF HIGHER LEARNING.

These institutions are provided for in the constitution of the state, and the legislature very early passed laws for their location and equipment. The framers of the constitution intended that there should be one institution, with agricultural, normal and collegiate departments, and there was a very spirited contest among several of the cities of the state for its location. Indeed, the competition was so warm and so much feeling was engendered, that the legislature deemed it the wisest solution of the question to locate the university in sections—the collegiate department in Lawrence, the agricultural department in Manhattan, and the normal department in Emporia. While this arrangement seems to violate the letter of the constitution, it does no violence to its spirit, and the higher educational development of the state has doubtless been broader and more rapid than if these three institutions had been consolidated into one.

The State University.—The University of Kansas opened its doors to students in September, 1866, and that year enrolled fifty-five students, all in the preparatory department, none of collegiate rank. It was not until 1873 that the first class was graduated from the collegiate department—a class of three members. The growth of the institution has been steady and rapid. In 1889 the preparatory department was abolished, and the work of preparing students for college entrance fell to the various city and county high schools in the state. Putting such responsibility on these schools, and trusting them to meet it, has done much to bring them to a higher level of scholarship and efficiency. The University now inspects the high schools, and, on a favorable report by the inspector, accepts the certificate of the completed preparatory work from the high-school principal; so the high-school graduate enters the freshman class of the University without condition.

There are seven schools in the University organization—arts, engineering, law, pharmacy, fine arts, medicine, and the graduate school; each school having its own faculty and dean, and giving appropriate degrees. All the schools of the University are under the control of a board of regents of seven members, six of whom are appointed by the governor of the state and confirmed by the senate, the seventh member being the chancellor of the University.

Most of the courses in the schools of the University are four years in length, the law course being three years in length, and the shortest pharmacy course two years. As yet, only the first two years of a four-year medical course are given in the medical school. Measures are now being undertaken that will enable the University to give the complete course and confer the medical degree.

The annual enrolment of students in the University approximates 1500, and at the June commencement each year diplomas and degrees are given to more than 200 graduates. There are ninety members in the faculties of all the schools.

The national government, as in the case of most Western states, granted two townships of land as an endowment for the University; the land has been sold and the proceeds invested in interest-bearing securities, in accordance with law. This endowment aggregates about $135,000, and yields about $7000 income annually. Of course, this is only a small fraction of the expenses of operating the school, which total $200,000. The annual legislative appropriation is $170,000, and the students pay incidental fees, ranging from ten dollars to forty dollars each.

The State Normal School.—This institution, admirably situated in the city of Emporia, has a larger attendance than any other state normal school in the Union, annually enrolling nearly 2000 students. In the high grade of scholarship for which the school stands, and in the high attainment of its graduates, the school ranks among the best in its class. The Normal School was opened in 1865, and in the difficulties and calamities that have been met and overcome it well illustrates the motto of the state: *Ad astra per aspera.* At one time the legislature withdrew all appropriations; at another, the building was entirely burned; but the building was replaced and enlarged, other beautiful buildings have been added, the legislative appropriation was restored, with generous increases from year to year, and the school has gained a very honorable place in the confidence of the people of the state.

The Normal School did not share in the federal land grant for the University, but by a coincidence received the same number of sections of land (seventy-two) as a grant of the salt spring tracts and adjacent sections from the state legislature. The sale of these lands created an endowment for the State Normal School of about $250,000. The interest on this endowment, with appropriations from the legislature, meet the operating expenses of the school.

There are fifty members of the Normal School faculty, and each year about 200 students are graduated from the various courses. Since the founding of the school there have been graduated nearly 2000 students.

The function of the State Normal School is to give to its students such general and specific training as will fit them to become Kansas teachers. That it performs this function successfully is shown by the fact that the demand for teachers trained in the Normal School is always far in excess of the supply. Normal School graduates are holding many of the most important educational positions, not only in Kansas, but in other states as well.

At present the State Normal School offers two courses—an elementary course of three years, and a four-year course. The four-year course is not rigidly prescribed, but offers a considerable choice of optional studies. The diploma of graduation from either course is a valid certificate to teach in any Kansas public school.

There is a Western Branch State Normal School at Hays City, which offers two years of the course offered at Emporia, and a State Normal Manual Training School at Pittsburg, both of which institutions are under the control of the board of regents of the State Normal School. This board of six members is appointed by the governor and confirmed by the senate for a four-year term, three of the members retiring each two years.

The State Agricultural College.—This school was established in 1863, and has received more liberal grants from the national government than either of the other state schools of higher learning. The initial land grant for endowment was nearly 90,000 acres, the proceeds from the sale of which amount to a little more than $500,000. This fund is invested in interest-bearing securities, and the income used for the current expenses of the college.

Two other laws of Congress have been of special benefit to the college, and have aided much in its development: The Hatch law of 1887, in accordance with the terms of which an annual appropriation of $15,000 is received for the support of the experiment station; and the Morrill law of 1890, which provided an appropriation of $15,000 for each state agricultural college, with an annual increase of $1000 until a maximum of $25,000 annually should be reached. In accordance with these two laws, the Kansas State Agricultural College now receives from the United States treasury $40,000 a year for the prosecution of the work for which the institution was founded. The income from the endowment is about $30,000 a year. So that, directly and indirectly, the college receives $70,000 a year from federal grants.

There are five four-year courses offered in the college: agriculture, mechanical engineering, electrical engineering, general science, and domestic science. For the benefit of those who are unable to avail themselves of the advantages of a full course, there are short courses in agriculture, dairying and domestic science offered. These courses require work for two twelve-week terms. The practical quality of the work of the Agricultural College appeals to all who believe in industrial education, and the institution has grown to be one of the largest and best-equipped agricultural colleges in the country. The faculty numbers seventy-five members, and the annual enrolment of students exceeds 1500.

The Fort Hays Branch Experiment Station of the State Agricultural College was opened in 1901. For this purpose there is available about 4000 acres of land, part of a former military reservation, but ceded in 1900 to the state of Kansas for the use of a Branch Normal School and a Branch Experiment Station. This station is under the control of the Board of Regents of the State Agricultural College, a body of seven members, six of them appointed by the governor, as in the case of the other state schools for higher learning, the president of the college being the seventh member.

SPECIAL STATE SCHOOLS.

Among the institutions for defectives and delinquents that are under the care and direction of the State Board of Charities there are six whose work is largely or mainly educational: School for the Blind, Kansas City; School for the Deaf, Olathe; Industrial School for Boys, Topeka; Industrial School for Girls, Beloit; School for Feeble-minded Youth, Winfield; and Soldiers' Orphans' Home, Atchison.

The names of these institutions indicate the scope of their work. For the inmates, the state pays all the expense of tuition and maintenance. The annual enrolment in these six schools is somewhat more than 1000 pupils. Under the Board of Charities, which visits each institution once a month, executive authority is vested in a superintendent, who is appointed by the board. They also appoint all teachers, officers, and attendants. The work in each of these difficult fields is in the hands of experts, and much has been done to give to the deaf, the blind, the incorrigible, the feeble-minded and the homeless such training and development as will enable them to find, so far as is possible, ways in which to become self-supporting and self-respecting members of society.

State Normal School, Emporia.

The Kansas schools for higher learning have grown in numbers, in influence, and in the quality of their work, until now they are giving training to nearly 5000 of the most capable and promising of the youth of the state, sending out each year more than 500 well-trained graduates to be competent leaders in the intellectual, professional, and industrial life of the state. The public is recognizing the importance of this work as never before, and is demanding that it receive adequate support. The educational appropriations of the legislature of 1903 are more liberal than any hitherto made, and are enabling the various state schools to enlarge their work and to occupy important fields which they have not been able to occupy before because of inadequate resources.

COUNTY NORMAL INSTITUTES.

When, through lack of appropriations, the state legislature closed two of the three state normal schools in existence in 1876, the necessity of providing at least a partial substitute for the technical training of which the teachers

Main Building, State Agricultural College, Manhattan.

of the state had been deprived led to the establishing by law of the present normal-institute system.

The law under which the institutes are held provides that a session shall be held for four weeks each year in each county of the state. The expenses of the institute are met as follows: A registration fee of one dollar is paid by each person enrolling; each person examined for a teacher's certificate pays a fee of one dollar; the state pays fifty dollars to each county having an institute enrolment of thirty-five members; and the county commissioners of each county may appropriate not to exceed $100 annually. The county superintendent employs conductor, instructors and lecturers for the institute, and pays them from the normal-institute fund just described. There are comparatively few of the 12,000 teachers who conduct the schools in the 9000 school districts of Kansas who have not at one time or another been enrolled as normal-institute students. The normal institutes are held in the summer vacation, and each year there are more than 10,000 actual or prospective teachers enrolled.

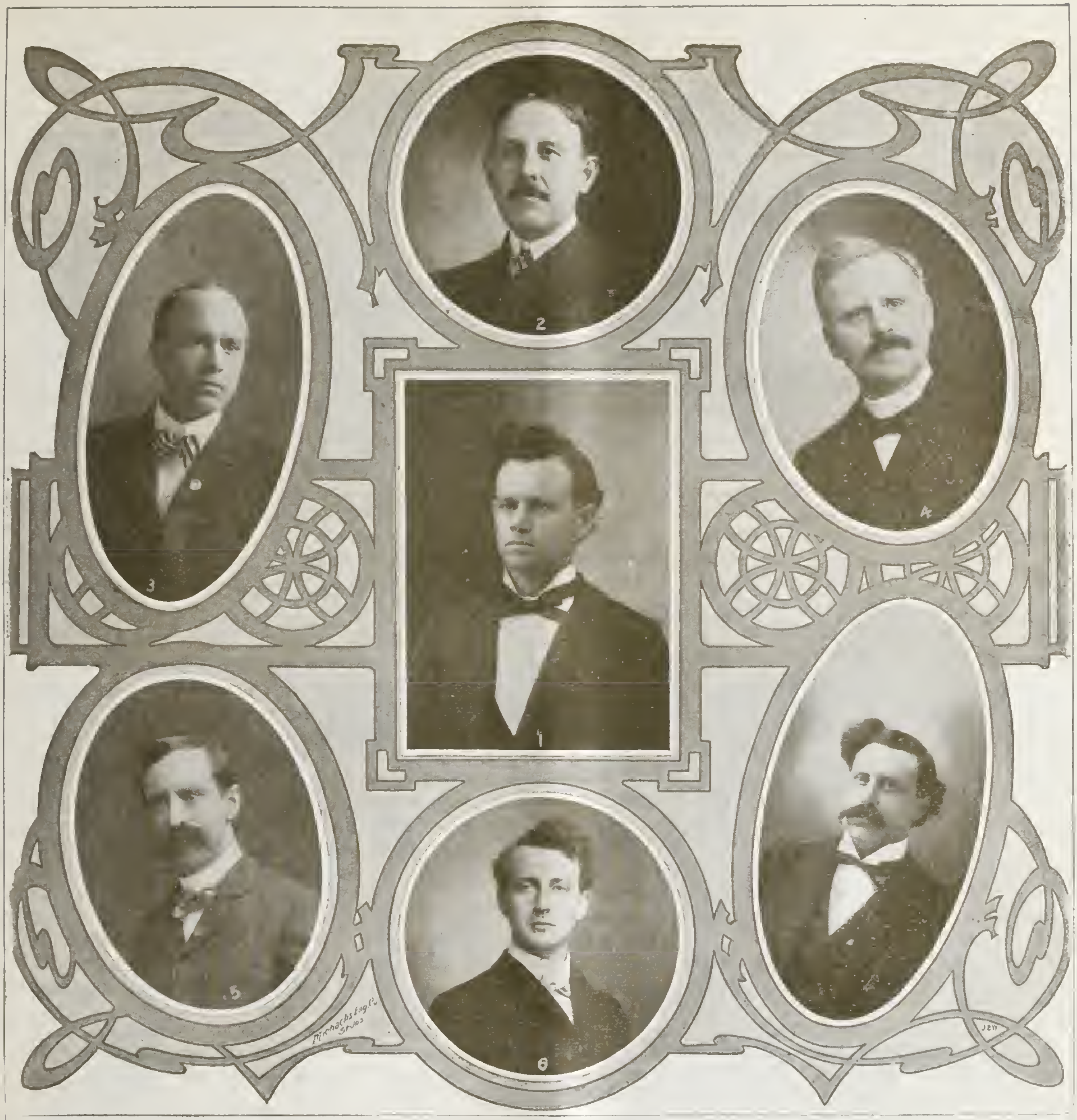
DENOMINATIONAL SCHOOLS.

No small share of the intellectual and ethical advancement of Kansas is due to the "faith and works" of the religious organizations of the state in organizing and maintaining schools — usually schools for secondary and superior instruction. This has involved much of privation and sacrifice for many of the pioneers and leaders in this field of work; but the results of the work done are creditable alike to the state, the colleges, and the organizations back of the colleges. In addition to the collegiate work offered by the religious denominations, there are many academies, some of them being connected with the colleges as preparatory departments, others having no connection with or control by the college. Also, in larger cities, there are many parochial schools of primary grade.

Speaking generally, the denominational colleges require the completion of a good high-school course for admission, and the collegiate course is four years in length, leading to various baccalaureate degrees.

The limits of this article will prohibit anything more than a brief mention of a few representative institutions.

The Methodist Episcopal church supports and controls three colleges, with an annual enrolment in collegiate and preparatory departments of about 1200 students — Baker University, located at Baldwin, Southwest Kansas College, at Winfield, and Kansas Wesleyan University, at Salina.



FRANK STRONG, Chancellor State University.
E. R. NICHOLS, President State Agricultural College. JASPER N. WILKINSON, President State Normal School.
I. L. DAYHOFF, State Superintendent of Public Instruction.
H. M. CULTER, Norton. O. G. MARKHAM, Baldwin. E. A. SHEPARDSON, Pittsburg.

KANSAS STATE BOARD OF EDUCATION.

Baker University has the honor of being known as the oldest collegiate institution in Kansas, having opened its doors for students in the fall of 1858.

The Congregationalists control and direct Washburn University, at Topeka, and Fairmount College, at Wichita. Friends' University, at Wichita, is under the control of the Friends' yearly meeting of Kansas. Emporia College, Emporia, is a Presbyterian institution; Bethany College, Lindsborg, a Swedish Lutheran; Midland College, Atchison, Evangelical Lutheran; Ottawa University, Ottawa, Baptist; Cooper Memorial College, Sterling, United Presbyterian; Campbell College, Holton, United Brethren; and College of the Sisters of Bethany, Topeka, Episcopalian. The last named is a boarding school for girls; the others named are coeducational.

Important academies are conducted by the Presbyterians at Wichita, Baptists at Hiawatha and Washington, Friends at Haviland, Galena, and North Branch, and Catholics at Leavenworth, Atchison, and Concordia.

PRIVATE EDUCATIONAL INSTITUTIONS.

The generous support and wide adaptation of public schools of various grades have restricted to some extent the development of private educational enterprises. According to the latest report of the state superintendent of public instruction, there are forty-four private schools in Kansas: three private normals, two medical colleges, ten schools of music, two of oratory and elocution, and twenty-seven commercial. Eleven of these private schools are in Topeka.

Speaking generally, the private schools of Kansas are engaged in lines of work that cannot at present be undertaken advantageously by public educational agencies. There will always be a field for, and a need of, such work. In Kansas, however, the field for private educational enterprise is much smaller than in most of the Eastern states.

CONCLUSION.

In this necessarily brief presentation of the educational system of Kansas it has been possible to touch only the most salient points, but it must be obvious, even to the casual reader, that the system is marked out on broad, generous lines that include all the fundamental interests of the commonwealth. The state is just now rounding out a half-century of educational activity; and in that period, on the foundations laid broad and deep through the wisdom and devotion of the pioneers, has been builded a system of schools that contributes to the forming of the highest types of manhood and of citizenship. The educational progress of the past has been in all ways gratifying, both in its material and intellectual elements; and in the problems that are to-day before us, awaiting solution and adjustment, there are possibilities of future progress that shall be no less stimulating to human development, and no less beneficial to the state

A New State Training School for Teachers, at Emporia.

ART

By MRS. C. F. W. DASSLER,
LEAVENWORTH.

"All that is true and beautiful is art.

THERE was a time when painting and sculpture were alone considered entitled to a high place in the domain of fine art. This still is theirs, but the advanced thought of the times, the restless effort for the amelioration of the human family in all that pertains to a purer, nobler and better life, in instilling the love of the beautiful, even in the humbler walks of life, has so molded and broadened the domain of art, that every expression of the beautiful, whether on canvas, marble, plaster, wood, metal, glass, porcelain, or other material, belongs to, and is, art. A craft-worker, expressing in the work of his brain and hand the beautiful, is an artist. In all departments of human progress not only is manual dexterity required, but also the skill and taste which come from a high degree of culture. This is art. Art enters into the humblest avocations, glorifying the most common task.

The early conditions in this state were unfavorable to the rapid development of art. The energies of the people during that period were absorbed by the founding of new homes, by contentions with barbaric tribes, and by the deprivations and losses incident to the civil war. Yet there never was a time when the claims of art were utterly ignored.

Immediately following these years of trouble, the inclinations of the people in Kansas for artistic endeavor become apparent in writings and publications. As an instance, in several numbers of the *Kansas Magazine*, a monthly published during the years 1871 to 1873, are to be found some excellent articles teeming with a longing for the expression

John Douglass Patrick.

of the beautiful, and expressive of the development of the culture requisite to the appreciation of artistic effort. Among these is one in which the writer, telling of the progress of art work in the West, and noting the shifting posture of the artist as he copied the wild majesty of the dying animal on the plains, quotes an admirer as saying: "I doubt if there be any country but Kansas and Nebraska where the brush follows so hard on the rifle."

Environment is a potent factor in the development of artistic taste, in creating a desire for participation in art work, and in imbuing the soul of the art worker with that nameless influence comprehended in what is termed a favorable art atmosphere. The sunny skies of Kansas, her undulating prairies, her wooded rivers, sloping hillsides and exuberant atmospheric conditions, present to the artist a field of labor that is an inspiration to the idealism so requisite to success. The impossibility of reproducing with the brush this incomparable natural condition is summed up in a paragraph much quoted by the press, as follows: "I desire," said the man of great wealth, "a painting that shall represent all that is beautiful. I would have the soft radiance of the rainbow mingled with a low haze as of a shower of golden dust. I would have the atmosphere such as must have surrounded an Eden, and through it all I must find the expression of peace, happiness, and contentment, unalloyed. A fortune awaits the completion of this picture." "Alas," exclaimed the great artist, "it can never be! To attempt it is to fail. You have asked me to paint a Kansas fall."

Art exhibits have been for years an interesting and prominent feature at educational meetings, literary meetings, and the conventions of women's clubs. The exhibits have been very comprehensive, including all kinds of art and art-craft work, such as brush work of all kinds, ceramic work, art needlework, decorative work, as well as other exponents of the trend to the beautiful and refined.

The Leavenworth Art School.

At the colleges and in the State University departments of art have received exceptional attention, while in many of the public schools of the state art instruction is a part of the curriculum.

For the development of art the hearty sympathy of the people is required, no less than the enthusiasm of the artist. This requisite is not wanting in this state, as is to be seen in the beautiful paintings and works of art that adorn the homes of many of her people, and the increase in the number of those is an indication that the taste for art is becoming more general. The work of the artists of Kansas is to be found throughout the state; in the buildings, both public and private; in the humble homes on the boundless prairie; in the artistic cottages in the villages, and in the stately mansions in the cities.

The work of Kansas artists has made its way into other states, while some of it has found recognition and fame in the art centers abroad. One whose place is in the front rank is John Douglass Patrick, at this time residing in Johnson county, Kansas. His work was admitted to the Paris salon, and at the Universal Exposition, in Paris, in 1889, he was awarded a medal for a canvas, about nine feet wide by eleven in height, the subject being "Brutality." This painting was displayed in the American section at the exposition. When it is considered that it was one of the thirteen among the large number there shown by American artists that earned such recognition by the jury of awards, its artistic worth is beyond question. The noted art critic, Mr. Theodore Child, placed Mr. Patrick among the best of American oil-painters. The press complimented him highly. An extract from an article that appeared in the Chicago *Inter-Ocean* reads:

"His picture in the salon this year attracted much attention because of the simplicity of the subject, the dramatic grouping, and the forceful yet artistic handling. 'Brutality' represents a French drayman beating his horse because of its inability to draw the heavy load. This class of subjects was not the natural selection of the young American, who was rather given to painting sweet faces and delicate draperies, but the sensitive nature, which found delight in the purely beautiful, was deeply touched by the cruelty seen on the streets of Paris."

Mr. Patrick is a Kansan, his early education being in the public schools of the state; an ardent student of nature, with a love for the beautiful, a tone of realism, an effort toward originality, which, coupled with his power of execution, place him among the strongest of Western artists. He is a devotee of art for its own sake.

In sculpture, Vinnie Ream Hoxie, who during her girlhood resided in Kansas, has acquired fame. Her notable productions are two statues, one of Abraham Lincoln, in the national capitol; the other of Admiral Farragut, in Farragut square, in the city of Washington. She is still a contributor to art in the execution of busts and statuary, being at this time engaged in the modeling of a heroic-sized statue of Ezra Cornell, to be cast in bronze and placed at Cornell University.

Throughout the state are to be found associations for the advancement of artistic influence, such as painting clubs, art unions, and societies, that, in their localities, have done and are doing effective work in the dissemination of artistic knowledge and the promoting of individual taste and effort in art achievement.

Among the many art studios in the state, that of the Leavenworth Art School, which is maintained by the Leavenworth Art League, an incorporated women's club, merits special attention. It is considered, especially by the women of the state, as a leading and efficient institution in the domain of art. Students who have received their first instruction in drawing and brush work at this school are to be found in many parts of the United States engaged in artistic pursuits. Artists who have visited its studio have commended it highly. Among the students who have gone forth from this school and achieved recognition is Miss Cora B. Gould, who afterward graduated at the Students' League, in New York. Her work in pastels has been highly commended. She received a medal for portrait work at an exhibition at the Cooper Union.

In this state the influence of art — that is, true art, the expression of the beautiful in whatever department of the busy life it is shown — stands for all that is best. Permeating every effort of humanity, inciting to an endeavor for a higher civilization, a broader and generous companionship, in which all may join in production or admiration, it forms the center around and to which the best effort of all is constantly directed.

WOMEN'S CLUBS.

DURING the twenty years following the organization of the state, in the year 1861, there existed many clubs and societies of Kansas women for art, educational, literary and philanthropic purposes, mainly in the larger cities and towns. An early benevolent undertaking of the women in the state was the organization, in the year 1868, of the Kansas Association for Friendless Women, which, since that time, has maintained the Home of the Friendless, located in the city of Leavenworth. The annual meetings of this association and its monthly paper, *The Home Record*, which has been published since 1872, were suggestive to the women of the effectiveness of united action and an inspiration to further cooperative effort.

It was not until the year 1881 that a potential effort was made towards a union of the clubs. Up to this time the club life of the women in the state had been local. The meetings were usually held at the home of some member of the club, the proceedings seldom appearing in print. At a meeting of prominent Western women, many of whom were members of Kansas and Missouri clubs, held at Leavenworth, Kan., Thursday, May 19, 1881, the Social Science Club of Kansas and Missouri was organized. This first association of women's clubs in the West, with Mrs. Mary Tenney Gray, of Wyandotte, as its first president, was organized by representative women from Atchison, Lansing, Leavenworth, Olathe, Topeka, and Wyandotte in Kansas, Kansas City and St. Joseph in Missouri, and Chicago, Ill.

The preamble to its constitution and by-laws reads thus: "The objects of this society shall be to promote a better acquaintance among thoughtful woman of this section who are most desirous and best able to raise the standard of women's education and attainments, to enlarge their opportunities, and by frequent meeting bring the highest knowledge of each for the benefit of all." The meetings of this association were held in various cities in Kansas, also in Kansas City in Missouri, two meetings being held each year. The programs at these conventions were comprehensive, embracing the departments of art, archeology, domestic economy, education, history and civil government, literature, natural science, sanitary science, philanthropy, and reform.

About the year 1885 a general movement was started to federate the women's clubs in many states, which a few years later in Kansas resulted in the forming of the Kansas State Social Science Federation, a federation of Kansas clubs, with the Social Science Club of Kansas and Missouri, as its nucleus. At a meeting of the social science club held at Lawrence, May 9, 1890, a motion that the Social Science Club of Kansas and Missouri apply for membership in the General Federation of Women's Clubs was carried, and thereupon this club became a member of the general federation. Gradually this association merged into the present state federation, the Missouri clubs and members from that state separating from those of Kansas at the last meeting of the Social Science Club of Kansas and Missouri, held in the year 1895.

Since the merger of the social science club into the present state federation, this association has experienced a phenomenal growth, until now it represents more than 100 clubs, with a membership of over 5000 women. It has become a powerful exponent of the advanced thought of women in this state. The success of the state federation has led to the federation of clubs in many localities, known as city, county and district federations.

Mrs. Mary Tenney Gray.

The clubs, through the state federation, have from time to time taken an active interest in the public affairs of the state. In their meetings, through the press and on the rostrum they have advocated measures for the advancement of the people. These efforts have materially aided the passage of legislation for the introduction of manual training in the public schools, the establishing of school libraries, and of the Industrial School for Girls; also for many other beneficial innovations.

The most prominent and successful among these is the traveling library, which has become a permanent department of the state library. For some time prior to 1899 the state federation had maintained a traveling library, for the use of the smaller towns. This undertaking increased to such an extent that the federation, finding itself financially unable to supply the demand for books, appealed to the state. The legislature in 1899 created the Kansas Traveling Libraries Commission, composed of the president of the state federation, the state librarian, and three persons appointed by the directors of the state library. The state librarian is the chairman of this commission. This library is a valuable auxiliary to the educational system of the state, supplying the use of books to the people in the smaller towns and rural communities.

The institution of a traveling art gallery, under the auspices of the state federation, is well under way, and promises to be as successful as the traveling library.

The individual clubs and subfederations in the state have contributed to philanthropic work, in the beautifying of school buildings and grounds, the laying out of parks, the establishment of rest-rooms, and the amelioration of civic conditions in their localities.

For years there have been associations of women in the state advocating the granting of the right of suffrage to women. Their efforts have met with success in the passage of laws under which women participate in the election of municipal officers in the cities and the officers of the school districts throughout the state. Their present effort is directed to secure the amendment of the state constitution so as to provide for equal suffrage.

Among the many achievements of women's clubs in this state must not be forgotten the work done by the Columbian clubs for the Columbian Exposition of 1893, covering a period of more than one year prior to the opening of the exposition at Chicago. Seventy-four of these clubs were organized, some with membership as high as 300, and through their effective work a large amount of money was raised to enable a display to be made. The decorations and furnishings and the larger part of the exhibits in the Kansas building at this World's Fair were collected and donated by these clubs. Their contributions were also in evidence in several of the main exhibit buildings. All this was the result of the labor, time and thought of the members of these clubs. The state musical demonstrations in the Kansas building on September 14, 1893, and in festival hall on September 15 and September 16, were a credit to these clubs, to the musical organizations of the state participating, and to the people of Kansas. Many of these Columbian clubs, after the close of this exposition, maintained their organizations, being transformed into clubs for artistic, educational and literary effort.

In 1903, during the flood along the Kansas river, the women's clubs of the state, especially those in the larger cities, were among the first to respond to the demands for the relief of the sufferers, collecting and sending clothing, money and provisions to the needy. This prompt and effective aid was made possible because of the existing club organization.

It is said that, among the states of the Union, Kansas, in proportion to population, is in the lead, both in the number of clubs and in the number of club members. It is a fair estimate that there exist at this time in the state, including all classes and kinds of women's clubs, near 500 organizations, with a membership not far from 10,000. These associations constitute a power for educational, moral and social advancement that is a potent factor in the splendid civilization, culture and refinement of which the people of Kansas are justly proud.

Cora G. Lewis, President 1903-'04.

While the effective work already mentioned is a testimonial to the value of women's club work in the state, yet it is, and must always be, secondary to the magnificent results achieved by those clubs in the advancement of the fine arts, art-craft work, the beautifying of the homes, the education of the children. The natural love of woman for the beautiful and refined, her interest in all that tends towards the ideal home, her unselfish consecration to artistic endeavor, her sympathy for the needy and unfortunate, will always remain the social condition in which her work is at its best. This, the greater work, the most extensive, is not susceptible of enumeration, permeating all conditions of the human family and ever present. The advanced condition of civilization in Kansas could not have been, was not possible, without the women's clubs.

1866.

STATE INSTITUTIONS

By F. B. DENMAN, OSBORNE.

THE charitable institutions of Kansas, nine in number, are under control of the Board of Trustees of State Charities and Corrections, consisting of five members, who are appointed by the governor for a term of four years, and are empowered as a board of control, with full and complete power to adopt and enforce all necessary rules and regulations required under the law for the government of said institutions; to appoint all officers; buy supplies; carefully supervise and direct the management and affairs of said institutions; and faithfully and diligently promote the object for which the same have been established.

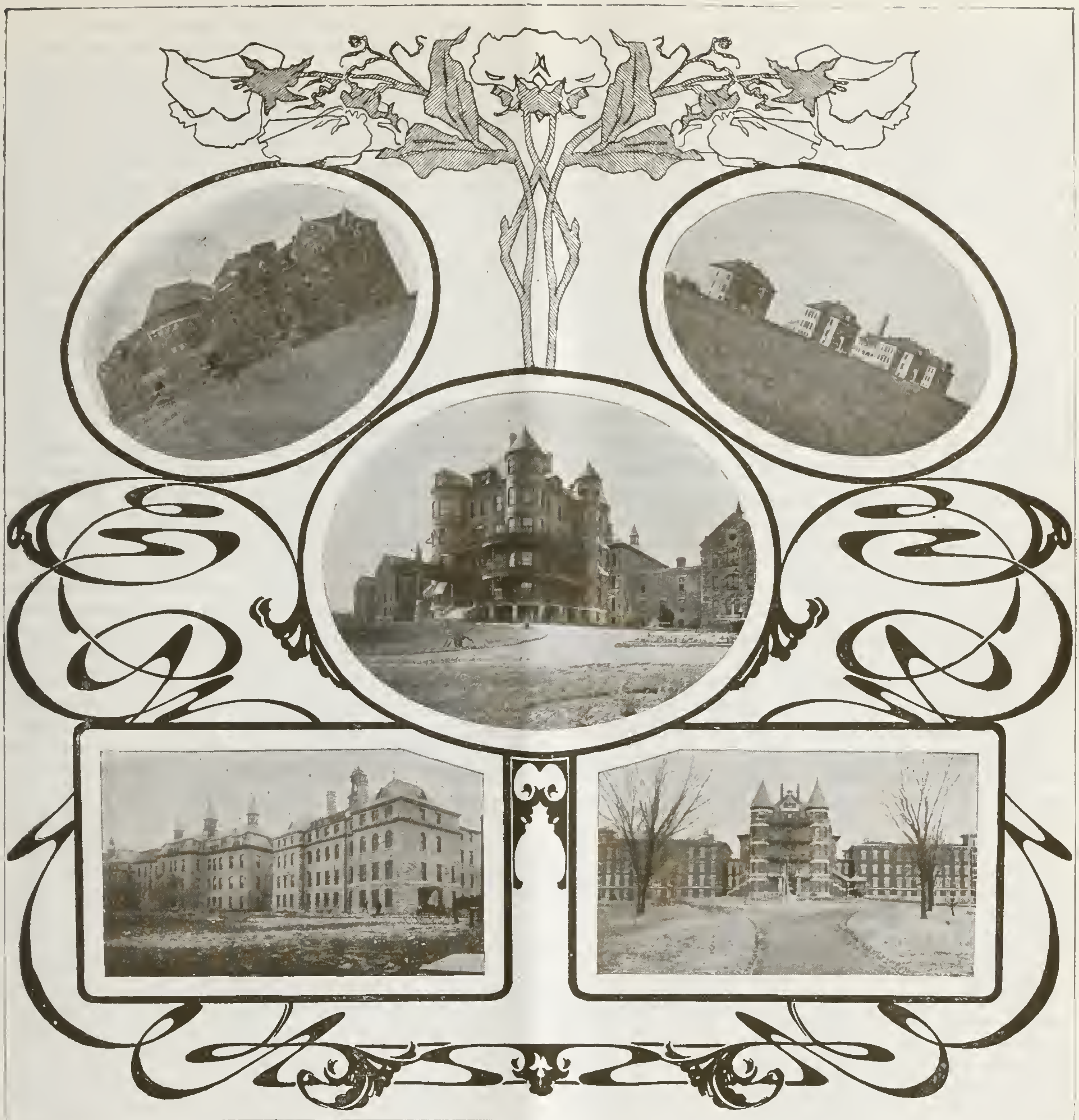
Although the appropriations have been somewhat limited and wages paid the different employees are small as compared with like institutions in many other states, we find them up to the standard, and in many respects far ahead of similar ones in much older and wealthier states, and are in the best and most flourishing condition at present that they have ever been, partly owing to the fact that there have been many new and practical as well as very interesting features added to the different industrial departments, and partly owing to the fact that there has been more land added to some institutions for outdoor work and exercise of patients, and also the erection of new buildings which greatly add to the convenience of the unfortunate wards contained therein.

Two of our institutions are really schools, and need no farm land. The School for the Deaf and the School for the Blind are purely educational institutions, while in the other seven there are many idle who are physically able to do farm work, and who are much better in every way by being provided with the most healthful and satisfactory of outdoor labor. Nothing is better for the mentally afflicted than labor suitable to their condition and strength. It furnishes diversion from their delusions, occupation for their faculties, and healthful physical exercise, which it is difficult to induce them to take except as some pleasant work is provided. No kind of labor is so pleasant, safe and satisfactory for most male patients as work on farm or in orchard, which pays not only in improved physical condition and happiness of patients but in the economical administration of the institution as well.

Political influence has entered too largely into the control of state charitable institutions. The law enacted by the last legislature was a step in the right direction. This law provides that employees should not be removed for political reasons, and that merit should be the basis of their service. This law, however, places within the board the power of selecting the employees of every institution. We believe that a more effective way of divorcing the institutions from politics would be to make the superintendents of the various institutions wholly responsible for the selection of their official staff, and all other employees of their respective institutions; establish a proper system of examination for each branch of the service, which shall test the intelligence and capacity of the applicant; prohibit the superintendent from giving any attention whatever to political influence. A superintendent who is answerable to the board for the conduct of the institution, and whose tenure of office rests wholly within the pleasure of the board, will make efficiency the chief consideration in the employing of his help.

Following is a short sketch of each institution.

The Topeka State Hospital, at Topeka, of which Dr. T. C. Biddle is superintendent, is a lovely place, both inside and out of the buildings. It was opened June 1, 1879. All applications for admission of insane patients are received here from the different counties of the state, and patients are either allowed to stay here, or are sent to Osa-



State Hospital, at Osawatomie.
State Hospital, at Parsons.
State Hospital, at Topeka.
School for Feeble-minded Youth, at Winfield
State Hospital, at Osawatomie.

KANSAS STATE INSTITUTIONS.

watomie, owing to the part of the state in which they live. The buildings are built of stone and brick. Most of the buildings are three stories high, have wide corridors, large and well-equipped dining-rooms, and good-sized patients' sleeping-rooms, heated by steam and lighted by electricity, as are all buildings under charge of the State Board of Charities, and have a capacity of 1100 patients, besides quarters for all employees—in all, about 150; has a large, new steam laundry, which is operated in most part by patients' labor, and turns out as good work as any private laundry. The lawn here is beautiful. The farm and grounds consist of 260 acres of land, together with a large brick farmhouse capable of holding thirty patients besides all necessary attendants. There are at present, approximately, 1000 patients, of which about two-thirds are male and one-third female. All insane patients in the state under state aid are in the asylums. The state is paying for no more in private hospitals or in poorhouses, which is a great saving to the state. The proportion of employees to patients is 1 to 6.75. Daily per capita cost, 35 cents.

The Osawatomie State Hospital, of which Dr. L. L. Uhls is superintendent, is the largest charitable institution in the state, and will accommodate about 1300 patients, together with 190 employees. There are at present on an average 1225 patients, nearly evenly divided as to sex. The buildings are of brick, three stories and basement, very substantial, and well equipped; has the best laundry of any institution in the state, and as good as any west of Missouri river; has a new hospital building, which is of great benefit in caring for the sick; also has its own ice plant, of twenty tons' capacity, which is a wonderful saving in labor, as well as money, to the state. There are 325 acres of land connected with this hospital, and an appropriation to buy more, which it needs very much. The proportion of employes to patients is 1 to 6.75. Per capita cost for daily support is 41 cents.

The first insane asylum in Kansas was located on the present asylum grounds at Osawatomie. It was a small two-story, square frame building; was erected in 1866; is still there, and is known as "The Lodge."

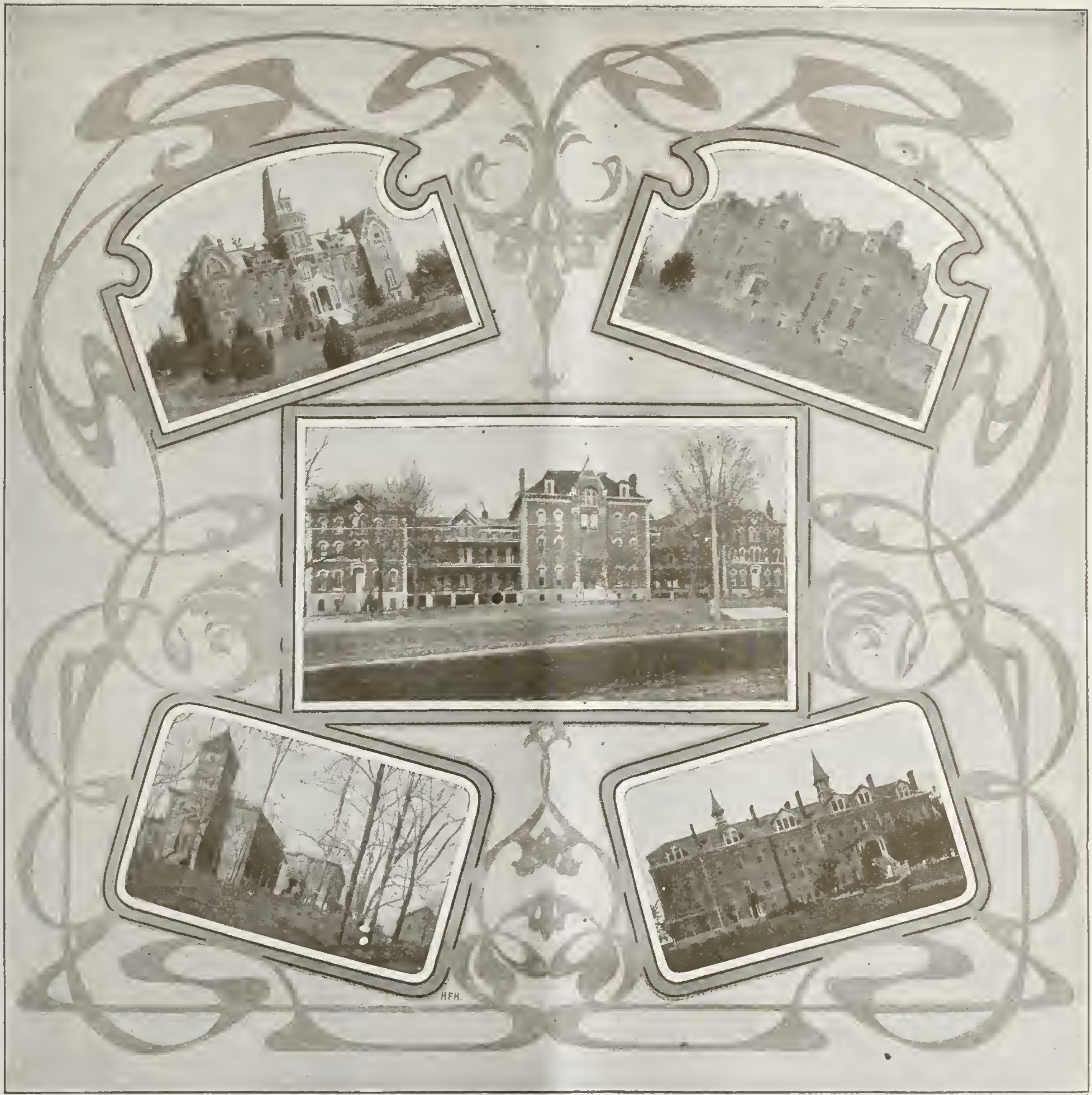
The State Hospital for Epileptics, at Parsons, is a new institution, opened last fall, and has about 140 male patients and thirty-five employees. This institution is for epilepties only, both sane and insane; is modeled somewhat after the plan of the Craig colony for epileptics at Sonyea, N. Y.; is built on the cottage plan, of buff brick and stone. This institution, when completed, will have thirty buildings, with a capacity of 1000 patients, and will be the most modern and best-equipped asylum in the world. The fuel used is natural gas, which makes a saving to the state of about seventy-five per cent. The proportion of employees to patients is 1 to 4. Daily per capita cost is 70 cents. Dr. M. L. Perry is superintendent.

The School for Feeble-minded Youth, of which Dr. C· S. Newlon is superintendent, is built on a 250-acre tract of land, and overlooks the city of Winfield. There have been many valuable improvements made here in the past year; has a capacity of 350 pupils and sixty employees. The buildings are of stone, very substantial, and crowded to their full capacity. While many of the inmates here are incapable of being educated, there are many who go to school, and learn to make fancy articles. The ratio of employees to pupils is 1 to 6. Daily per capita cost, 41 cents.

The School for the Deaf, at Olathe, of which Prof. H. C. Hammond is superintendent, is the oldest state institution in the state. It was organized as a private enterprise, or rather charity, as early as 1861, by Mr. P. A. Emery, of Baldwin, Kan. It was born amid the throes of civil strife and had a severe struggle for existence. It was finally, in 1863, recognized by the state with a small appropriation, paid in state scrip, which was then at a discount of from twenty-five to thirty-five per cent. A similar appropriation was made in 1864, but the tireless but unfortunate superintendent, after paying the running expenses of the school, found himself entirely without pay for his services. For three years he struggled hard, under the most trying vicissitudes, to keep the school on its feet, for which he received no compensation and has never asked relief from the state. This has become one of the most important institutions in the state, has an average attendance of 230 pupils, and is making wonderful progress. Its industrial departments consist of a printing-office, in which they publish *The Kansas Star*, a weekly paper, a bake shop, shoe shop, harness shop, and a cabinet shop, where all kinds of furniture, desks, etc., are made. There is a competent and experienced instructor at the head of each department.

The School for the Blind, at Kansas City, Kan.; Lapier Williams, superintendent. While the blind school is the smallest institution in the state, it is not of the least importance. Mr. Williams is doing a wonderful work. They have a new school building, including a gymnasium, which affords great amusement for the children. They have about 100 in attendance, who are being educated, not only in the common branches but some of the higher ones; besides, they learn to make brooms and hammocks. Music is their principal hobby, and they have the best of instructors in instrumental music. The advancement the pupils have made along this line in the last year is wonderful.

The Soldiers' Orphans' Home, at Atchison; E. L. Hillis, superintendent. The Orphans' Home is situated on 160 acres of land northeast of Atchison, upon the bank of the Missouri river—a beautiful location, in a good atmosphere, where children taken from the streets of the cities can take a long breath and expand their lungs with fresh air. This institution is intended as a temporary stopping-place or training school for homeless orphans and neglected



Industrial School for Boys, at Topeka. Industrial School for Girls, at Beloit.

School for the Deaf, at Olathe.

School for the Blind, at Kansas City. Soldiers' Orphans' Home, at Atchison.

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children, who may here be prepared for permanent homes to be found for them. They are taught cleanliness, good manners, industrious habits, and given the rudiments of an education. There are on an average 165 in attendance; three times as many boys as girls. There are forty-four employees. Proportion of employees to children, 1 to 4. Daily per capita cost of support, 72 cents.

The Boys' Industrial School, at Topeka, is ably managed by Prof. H. W. Charles, superintendent, under whose supervision the boys are making a wonderful advancement. While this institution is a place of confinement for crimes committed, there are no fences about it, and the boys are placed on their honor in a way; still there are few escapes, and very few but who are recaptured and returned. The boys go to school one half-day, and work in one of the industrial departments the other half-day. The industrial work consists of shoemaking, harness-making, tailoring, cabinet-making, baking, etc. The physical training and military drill have been introduced, with most wonderful results. There are on an average 180 in attendance, with thirty-six employees. Ratio of employees to boys, 1 to 5. Daily per capita cost for support, 47¼ cents. The farm consists of 170 acres, and is a lovely place.

The Girls Industrial School, at Beloit; Julia B. Perry, superintendent. This is another institution which was first started by private enterprise and donation. It was instituted and for a number of years managed by the Woman's Christian Temperance Union, and kept up largely through the efforts of Mr. and Mrs. Chas. H. St. John. After passing under state control, the first girl was committed May 10, 1889. At present the institution consists of three good stone cottages, all well built and equipped, and now occupied by 160 girls. The state is to be congratulated upon the present excellent condition of this school. The girls are happy and contented, and very enthusiastic in their school and industrial work, and were never making such rapid progress along all lines which lead to respected and useful womanhood. The farm consists of 150 acres of very rich second-bottom land. The industrial department consists of domestic economy, stenography, typewriting, and fancy work. Some excellent work has been turned out of this department and sold at high prices. This school is in the best condition it has ever been, and stands at the head of any in the state for advancement. Although there are no fences near this farm there has not been an attempted escape for two years, so greatly are the girls interested in the different lines of work and study, all due to the skill of the superintendent. There are twenty-two employees. Ratio of employees to pupils, 1 to 7. Daily per capita cost, 63 cents.

The State Soldiers' Home is located on the old Fort Dodge reservation, on the Arkansas river, five miles east of Dodge City, Ford county, Kansas. The idea of the home originated with Lewis Post No. 294, G. A. R., at Dodge City, Kan., through whose efforts a bill was introduced in Congress, passing both branches, and granting that portion of the old military reservation upon which buildings were located to the state of Kansas, for the purpose of locating thereon a State Soldiers' Home. The legislature of Kansas of 1889 passed an act establishing a home, and making appropriations therefor. Average attendance in 1902, 421 persons, and average cost per capita for the year $121.09.

The Mother Bickerkyke Home is an annex to the above, and is located at Ellsworth, Kan. This property was conveyed to the state and the property was placed under control of the board of managers of the State Soldiers' Home, at Fort Dodge, in 1901.

PENAL INSTITUTIONS.

Penitentiary.—In 1863 the legislature passed "An act to provide for the erection and regulation of a Penitentiary, and making an appropriation therefor." This act was approved February 21 of that year and commissioners were appointed to carry out the provisions of the law. Erasmus T. Carr was selected as the architect to prepare plans for the Penitentiary. Prior to 1863 the Leavenworth county jail had been used as a temporary State Penitentiary. On November 25, 1863, the present site of the Penitentiary, at Lansing, south of and close to Leavenworth, was decided on and the land purchased by commissioners appointed to locate the Penitentiary. The first work done in erecting the prison was in 1864, and consisted only of the foundation walls of the north wing. In 1866 work again commenced, and was continued until the completion of the building. The prison was first occupied July 11, 1868. In 1879 the legislature authorized the sinking of a coal-shaft, and work commenced November 26, 1879, and coal was reached January 18, 1881. In 1899 the legislature authorized the installation of a binder-twine plant. This plant has been a very profitable one for the state. A brick plant is operated, also, and during the fiscal year ending June 30, 1901, furnished 1,170,710 brick for the state. A school is also maintained, and a library is accessible for those who read. A parole system is now in vogue at the institution.

Industrial Reformatory.—In 1885 the legislature passed "An act to provide for the location and management of a State Reformatory." This act was approved March 7, of that year, and after the commissioners who had been appointed to locate the Reformatory had examined the various locations that had been offered for a site, the present one, at Hutchinson, was selected. In October, 1885, the contract was let for one wing of the Reformatory. The completed buildings contemplated an expenditure of $250,000. In 1902 a new cell block, containing 200 cells, each equipped with an individual lavatory and closet, and lighted with electricity, was completed. Since July, 1902, a cold-storage plant has been installed. A school for the education of the inmates is also maintained. Shoemaking, tailoring, stone-cutting, harness repairing, etc., are also taught. A library is at the disposal of the inmates. A system of parole now obtains at this institution.

Kansas Penitentiary Lansing.

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ST. LOUIS
EXPOSITION

1904

KANSAS SOUVENIR
ST. LOUIS
EXPOSITION

1904

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